

## Chapter 18

# Cultural Resources

*Cultural Resources* are defined in this chapter as prehistoric and historic archaeological resources, architectural/built environment resources, places important to Native Americans and other ethnic groups, and human remains. This chapter assesses potential effects of the action alternatives on cultural resources and identifies mitigation measures to reduce or eliminate effects on those resources. As necessary, additional site-specific studies and analyses will be conducted pursuant to CEQA, NEPA, and Section 106 of the National Historic Preservation Act (NHPA) as part of the second tier environmental review for the program-level components of the selected alternative pursuant to mitigation measures identified in this chapter.

This chapter first provides an overview of the methods used to identify the kind and density of cultural resources in the Plan Area. Following the methods discussion is a description of the environmental setting/affected environment as it pertains to the types of cultural resources that occur in the Delta region, including a subsection that describes known and predicted resources in the Plan Area. The chapter then describes the regulatory framework that governs cultural resources in the context of BDCP implementation and the analysis of effects, and describes the anticipated effects of the BDCP.

## 18.1 Environmental Setting/Affected Environment

### 18.1.1 Methods for Analysis

A number of standard methods such as record searches and site visits were used to determine the types and location of known cultural resources that could be affected by BDCP alternatives. Much of the Plan Area—particularly portions that could be affected by BDCP alternatives—were not legally accessible<sup>1</sup> (For a detailed discussion of DWR's efforts to obtain legal access to inaccessible portions of the Plan Area, see Appendix 4A, Summary of Survey Data Collection). Accordingly, a variety of methods were used to assess the kind and number of cultural resources that would be affected by the action alternatives and conservation components.

- Archival map research to identify overall sensitivity for historic-era resources as well as locations of built resources of at least 45 years of age.
- Field surveys for built environment resources that were accessible from the public right of way.
- Records searches to identify recorded cultural resources.
- A sensitivity analysis for unidentified resources historic-era and prehistoric archaeological resources (based on the density of recorded resources, geology and geological processes, and historic activity, included in Appendix 18A).
- Archaeological surveys for parcels that were legally accessible.
- Native American consultation.

<sup>1</sup> (*In Re Department of Water Resources Cases, JCCP Action No. 4594, Final Order April 8, 2011*).

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- Review of built environment resources using aerial photography sources such as Google Earth and Google Maps.

These data were compiled to provide an overview of the potential for the alternatives to result in significant effects on cultural resources. This data, as well as the prehistoric, ethnographic, and historic setting for the region, were used to identify the suite of cultural resource property types that may be affected by the alternatives. Specific effects associated with the alternatives and conservation measures are described below under Section 18.3.3, *Effects and Mitigation Approaches*.

### 18.1.1.1 Field Surveys

#### Initial Site Visits

Where access was available, cultural resource site visits were first conducted in 2009 to confirm the location of known resources. Site visits were conducted over 6 days: May 19–21, September 21, October 27, and December 7, 2009 to confirm the location of previously documented resources. Documentation focused on photographing previously identified resources with known photographic records and recording locations using global positioning system (GPS) units. This effort focused on 21 archaeological resources that were legally accessible. In addition, cultural resources surveys were conducted from May to August 2011 to confirm additional archaeological resources where access became available. Attempts were made to relocate 51 previously recorded sites in the Plan Area. These 51 sites were spread among 61 parcels. Survey of 30 sites and 8 Piper Sand accumulations on 32 parcels was accomplished. The majority of the sites revisited were in the southern and western portions of the Plan Area.

#### Field Surveys for Built Environment Resources

More comprehensive field surveys were performed in May and June of 2012 for those portions of the conveyance facility alternative alignments that could be viewed from public roads and accessible rights-of-way locations. Prior to surveys, built environment resources that required inventory and evaluation were identified using records of previously recorded resources, topographic maps, aerial photographs, and the date of construction. For built-environment resources, the entire survey was conducted from public right-of-way and all resources that could be adequately accessed were evaluated for significance under the NHPA and to determine if they met eligibility criteria for listing in the CRHR. Where dense tree cover or other elements such as recent structures or landscaping obscured resources, these resources were not evaluated because the associated parcel was not typically legally accessible for closer inspection. In addition, some large rural properties that contain many built resources, were not evaluated when structures could not be sufficiently observed and photographed from public roads because the setting could not be adequately observed. All built environment resources that were not adequately accessible are listed in Appendix 18B, according to alternative. Appendix 18B summarizes identified built environment resources and effect mechanisms.

#### Field Surveys for Archaeological Resources

Archaeological sites were visited where legally accessible, to update the site record forms and confirm the general nature and boundaries of the resource. Archaeological sites were not individually evaluated based on field survey data because such evaluation typically requires destructive test excavation to retrieve a suitable sample of material. Excavation of samples from

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archaeological sites is typically necessary for evaluation because the surface distribution of material provides only some indication of the nature and boundaries of the deposit. Layered deposits may have material from different time periods that is not visible from the surface. Text excavation retrieves a sample of such material to characterize the site and to demonstrate why the site does or does not have significance within the meaning of CRHR and NRHP eligibility criteria described above in the regulatory setting. In addition, where a deposit has been disturbed through natural or human processes, the site may not have sufficient integrity to convey this significance. Subsurface excavation is the only way to definitively assess the integrity of an individual resource within the meaning of the NRHP and CRHR.

Subsurface test excavation is considered destructive both within the professional practice of archaeology, and among the Native American community. Professional archaeologists consider test excavation destructive because it can only be performed once. After a portion of a deposit has been disturbed, the original spatial relationships between buried artifacts can never be perfectly restored for re-examination. In addition, because science improves over time, archaeologists assume that some data is always irretrievably lost during current excavations. Relative to future advances in science, current excavations destroy the possibility of retrieving information that cannot currently be analyzed based on available technology. In addition, the Native American community typically objects to excavation of prehistoric sites because many sites contain human remains that embody cultural and religious values and test excavation exhumes these remains, with the potential for inadvertent damage.

Because the geographic scope of CM1 is large, and because a range of alternatives are under consideration, destructive evaluation of all archaeological resources does not meaningfully enhance the analysis of effects sufficiently to justify destructive test excavation prior to the selection of an alternative for construction. While individual sites cannot be definitively evaluated through text excavation, suitable proxy measures offer a means of assessing the potential of the various conveyance alignments to result in significant impacts on CRHR and NRHP eligible resources as well as unique archaeological sites. These measures consist of analyzing the density and distribution of recorded resources, and estimating the nature and size of identified sites based surface observations. This approach allows for subsequent assessment of the potential of the alternatives to result in adverse effects on archaeological resources that are likely to qualify for the CRHR or NRHP.

All parcels that were legally accessible were surveyed for archaeological resources. Of the 49,224 acres of the constructability footprint (including the PTO, West, East, and SCO options), 2,231 acres were surveyed (4.53%). Parcels were walked in traditional transects, with archaeologists spaced no more than 20 meters apart at any time. Visibility of ground surface varied significantly, from excellent visibility to near zero where high grasses made visibility difficult. Identified resources were recorded on California Department of Parks and Recreation forms and surface boundaries were mapped.

### 18.1.1.2 Archival Map Research

Historic map research was conducted at the Earth Sciences and Map Library at the University of California, Berkeley, on October 10–12, 2011, and copies of all historic topographic maps within the boundaries of the Plan Area were obtained. Features identified on these maps have been compared with the footprint of action alternatives to identify the sensitivity of each alignment for historic-era cultural resources.

### **18.1.1.3 Records Searches**

Records searches conducted through the North Central Information Center, Central California Information Center, and Northwest Information Center of the California Historical Resources Information System (CHRIS) revealed that a wide variety of prehistoric- and historic-era sites, features, and artifacts have been documented in the Plan Area. These cultural resources include early Native American burial, habitation, and mound sites; gold rush-era residences; a shipwreck from approximately 1850; ranches; agricultural work camps and landscapes; railroads; water conveyance systems; levees; rural residences; rural communities; small and medium cities; landscapes; and bridges.

Some of these resources have been evaluated for the National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR) eligibility criteria, but the majority remains unevaluated either because they are inaccessible or because destructive test excavation is not currently feasible. Based on available records, many of these resources appear likely to qualify as historical resources and historic properties.

Identified resources were mapped with geographic information systems (GIS), and their locations were compared to the footprint of the alternatives.

### **18.1.1.4 Native American Consultation**

The Native American Heritage Commission (NAHC) was contacted on May 21, 2009, and May 5, 2011, for information about the location of known heritage or sacred sites in the Plan Area. The NAHC responded and provided a list of Native American individuals and organizations that may have knowledge of cultural resources in the Plan Area. Staff archaeologists sent letters to the parties identified by the NAHC on June 15 and 22, 2009, requesting information regarding resources that may occur in the Plan Area. The complete record of consultation with the NAHC and parties identified by the NAHC is provided in Appendix 18A.

The NAHC responded, indicating that the sacred lands file does not contain any resources mapped in the Plan Area. In addition, individuals contacted by letter responded regarding the sensitivity of the Plan Area. David C. Jones, Wintun Environmental Protection Agency executive director, Cortina Indian Rancheria (CIR), indicated in an email message on September 4, 2009, that CIR was not aware of any cultural sites in the Plan Area and therefore did not have any objections or concerns about the BDCP at that time. CIR would like to be advised of any cultural material or resources found and their disposition. Phoebe Bender, cultural resources information specialist, Rumsey Indian Rancheria, responded with a letter dated August 19, 2009. Ms. Bender's letter stated that, based on the information provided, the Rumsey Band of Wintun Indians of California would not be submitting comments for the BDCP. No additional comments have been received to date.

### **18.1.1.5 Geomorphology**

Archaeologists analyzed the geomorphology of the landscapes associated with the action alternatives as a means of identifying relatively level and stable geomorphic surfaces such as alluvial fans and stream terraces located near water that are particularly sensitive for habitation, in terms of both buried and surface archaeological sites because these landforms are attractive places for habitation and subsistence activity. This information was used to assess the sensitivity of the Plan Area for unidentified and buried cultural resources. This analysis indicates that the Plan Area is sensitive for additional resources that have not been recorded that may be associated with



numerous landforms where prehistoric archaeological sites may be preserved. This analysis is summarized in Appendix 18A.

## 18.1.2 Prehistoric Archaeological Setting

The Plan Area is located in the Central Valley, which is divided into two major physiographic provinces separated by the Delta. The Sacramento Valley, drained by the southward-flowing Sacramento River, lies to the north, and the San Joaquin Valley, drained by the northward-flowing San Joaquin River, lies to the south. The presence of all of this fresh water has resulted in a well-watered region, one of the most diverse and productive environmental zones in California (Rosenthal et al. 2007:147).

Although various peoples dwelled in the area now known as the Central Valley (to be discussed further in Section 18.1.4, *Ethnographic Setting*) and spoke a variety of languages, common linguistic roots indicate that these groups had a related history and regular interaction (Rosenthal et al. 2007:149). A shared heritage is also indicated by common technological, economic, ceremonial, and sociopolitical characteristics described by twentieth-century anthropologists who identified the Central Valley as the core of the California Culture area (Goldschmidt 1951b; Klimek 1935; Kroeber 1936, 1939).

Early inhabitants of the Central Valley used the various habitats found throughout the valley, including riparian forest, marsh, alkali basins, oak savanna, and foothill woodland communities. They created a sophisticated material culture and established a trade system involving a wide range of manufactured goods from distant and neighboring regions, and their population and villages prospered in the centuries prior to historic contact (Rosenthal et al. 2007:147, 149).

Over time, however, the majority of surface sites in the Central Valley, including many mounds, have been destroyed by agricultural development, levee construction, and river erosion. Many excavations of Central Valley sites in the early twentieth century were performed by untrained individuals who focused on artifact and burial recovery but paid little attention to other artifacts such as dietary remains and technological features, thus hampering modern attempts at reanalysis (Bouey 1995; Hartzell 1992). Additionally, the Central Valley's archaeological record has been affected by the natural processes of landscape evolution: surface sites are embedded in young sediments set within a massive and dynamic alluvial basin, while most older archaeological deposits have been obliterated or buried by ongoing alluvial processes. Consequently, archaeologists are challenged to identify and explain long-term culture change in portions of the Central Valley where the majority of the available evidence spans only the past 2,500 years (or, in rare cases, the past 5,500 years) (Rosenthal et al. 2007:150).

There is no single cultural-historical framework that accommodates the entire prehistoric record of the Central Valley. Moratto's (1984) well-regarded synthesis of Central Valley archaeology was based on works from Bennyhoff and Fredrickson (Elsasser 1978; Fredrickson 1973, 1974). The comparative frameworks established by Bennyhoff and Fredrickson (1994) incorporated a wide range of local and regional traditions but has not been systematically applied outside of the Sacramento Valley. For this reason, the following discussion uses a simple classification based on the three basic periods proposed by Fredrickson: the Paleo-Indian, Archaic, and Emergent (Fredrickson 1973, 1974). The Archaic period has been further divided into the Lower, Middle, and Upper Archaic based on newer radiocarbon dates, adjusted with modern calibration curves (Rosenthal et al. 2007:150). The discussion that follows is based on these divisions.

### 18.1.2.1 Paleo-Indian

The earliest accepted evidence of human occupation in the Central Valley during the Paleo-Indian Period (11,550–8500 BC) comes from the discovery of basally thinned and fluted projectile points at three separate locations in the southern portion of the basin (Rosenthal et al. 2007:151). Recent geoarchaeological studies have shown that periodic episodes of erosion and deposition during the Holocene have removed or buried large segments of the Late Pleistocene landscape (Rosenthal and Meyer 2004a, 2004b; White 2003b). Archaeological deposits associated with these ancient landforms either have been destroyed or lie buried beneath more recent alluvial deposits (Rosenthal et al. 2007:151).

### 18.1.2.2 Lower Archaic

As with the Paleo-Indian Period, the Lower Archaic Period (8000–5550 BC) is characterized by mostly isolated finds, including stemmed points, chipped stone crescents, and early concave base points. Typical examples of these artifact types have been found on the ancient shore of Tulare Lake (Fenenga 1992; Wallace and Riddell 1991).

### 18.1.2.3 Middle Archaic

The beginning of the Middle Archaic (5550–550 BC) brought about significant climate changes to the Central Valley: warmer, drier conditions; the development of the Delta as sea levels rose; and the stabilization of fans and floodplains around 5550 BC calibrated (written as cal BC or cal AD; calibration is used to convert the laboratory determination of carbon-dated materials to calendar years) (Rosenthal et al. 2007:152). Around this time, there appeared to be two distinct settlement-subsistence adaptations operating in central California—one centering on the foothills and the other on the valley floor (Fredrickson 1994:102–103; Rosenthal and McGuire 2004:161–163). Late Middle Archaic sites appear to be increasingly sedentary, as indicated by refined and specialized tool assemblages and features, a wide range of nonutilitarian artifacts, abundant trade objects, and plant and animal remains indicative of year-round occupation (Moratto 1984; Ragir 1972; Schulz 1970, 1981; White 2003a, 2003b).

### 18.1.2.4 Upper Archaic

The Upper Archaic (550 BC–AD 1100) is characterized by another change in climate conditions—this time, to a cooler, wetter, and more stable climate. These changes resulted in renewed fan and floodplain deposition and soil formation in the Central Valley (Rosenthal et al. 2007:156). New technologies were developed during this period, including new types of bone tools and bone implements and widespread manufactured goods such as *Haliotis* ornaments and ceremonial blades (Bennyhoff and Fredrickson 1994; Fredrickson 1974; Moratto 1984). Archaeologists recognized the archetypal Upper Archaic expression, identified as the Berkeley Pattern (Fredrickson 1973, 1974), in sites of the lower Sacramento Delta region containing large quantities of habitation debris and features (such as fire-cracked rock heaps, shallow hearths, house floors, and flexed burials) that reflected long-term residential occupation (Bouey 1995:348–349).

### 18.1.2.5 Emergent

The archaeological record for the Emergent/Historic Period (AD 1000) is more substantial and comprehensive than those of earlier periods in the Central Valley, and the artifact assemblages are

the most diverse (Bennyhoff 1977; Fredrickson 1974; Kowta 1988; Sundahl 1982, 1992). The Emergent Period, which enjoyed a relatively stable climate as opposed to the earlier periods, is associated with the use of the bow and arrow over the dart and atlatl (Bennyhoff 1994). Other characteristics of this period include a regionally variable economy, changes in manufacturing residues at Emergent Period sites, and the decentralization of shell bead production (Rosenthal et al. 2007:159).

### **18.1.3 Prehistoric Archaeological Property Types**

This section describes the prehistoric archaeological property types that are expected in the Plan Area. These property type descriptions are based on the prehistoric archaeological setting presented above. The term *property type* refers to a grouping of properties that share similar important characteristics. For this setting, property types have been broadly categorized into groups based on their cultural and historical associations. These two groups are subdivided as discussed below.

Identified property types provide reasonable expectations of the range of prehistoric archaeological resources that may be affected by the action alternatives. These property types are classified here in terms of constituents and features. Seven prehistoric archaeological property types have potential to be present in the Plan Area: midden/mound sites, multiple-occupation sites, human burials, lithic scatters, bedrock milling features, baked clay deposits, and isolated artifacts. Each prehistoric property type is described under a separate heading below.

#### **18.1.3.1 Midden/Mound Sites**

Midden and mound sites are anticipated to be the most structurally complex and to have the greatest artifact diversity of all the prehistoric property types. Middens are usually distinguished by a high organic content that causes soil to be noticeably darker, and they can vary greatly in size. Middens are found where people ate shellfish and other invertebrates, fish, birds, sea mammals, ungulates, small mammals, acorns, seeds, tubers, and other food resources. These food sources leave a large amount of debris, which customarily was piled up where the food was processed, eaten, and discarded.

Middens in the Plan Area were generally occupation sites, although some may have been used only on a seasonal basis. When deaths occurred, the middens sometimes were used as burial sites. Constituents may include flaked-stone debitage (byproducts of stone-tool manufacture), bedrock mortars, ground-stone tools, marine shell, vertebrate remains, charcoal, baked clay, charred floral remains, and fire-affected rock. Nonutilitarian artifacts also may include charmstones, shell ornaments, and beads. Discrete features, including house floors, hearths, and human burials, also may be located within these deposits.

#### **18.1.3.2 Multiple-Occupation Sites**

Multiple-occupation sites differ little from midden sites, lacking only the midden. This site type otherwise may contain the broad array of constituents and features described for midden sites immediately above.

#### **18.1.3.3 Human Burials**

Burial features can range in complexity from a simple isolated inhumation (burial or cremation) to more elaborate interments containing numerous bodies. These features may represent specially designated interment areas or remnants of larger archaeological sites. Burial associations often include shell beads and ornaments and ground and polished stone artifacts, such as charmstones and plummets. In the Plan Area, human burials are frequently interred in raised earthen mounds.

#### **18.1.3.4 Lithic Scatters**

Lithic scatters are accumulations of flaked- and/or ground-stone artifacts, including finished tools and debitage. They are perceived primarily as daily or overnight task-oriented camps where a limited range of activities was conducted. These sites may or may not contain chronological information, depending on the presence and quantity of diagnostic items such as projectile points and pottery, or dateable materials such as obsidian. Lithic scatters can be simple, containing only flaked-stone debitage and tools, or complex, having primarily flaked-stone debris but some ground stone as well.

#### **18.1.3.5 Bedrock Milling Features**

Bedrock milling features are typically bedrock mortars and/or milling slicks. Milling features can be isolated features or can be grouped together in a cluster. These features were used for processing vegetal resources such as acorns and other seeds. Because of a dearth of exposed bedrock in the Central Valley, milling features are typically associated with the Sierra Nevada foothills, where exposed bedrock is much more common. These features often have associated artifacts such as pestles and handstones. Flotation analysis of adjacent soils often can identify plant types that were processed at these sites.

#### **18.1.3.6 Baked Clay Deposits**

One baked clay deposit has been identified in the Plan Area. Baked clay artifacts and detritus emerged in the Plan Area in response to the stone tool-impooverished environment of the Delta and surrounding alluvial plains. Accordingly, artifacts of this sort include utilitarian implements, such as grinding tools and net weights for fishing. Bowls and decorative items were made of fired clay as well.

#### **18.1.3.7 Isolated Artifacts**

Isolated finds are three or fewer artifacts that occur within a restricted area, generally within an area 30 feet in diameter. Information potential usually is limited to location, material type, style, and function of the individual artifact.

### **18.1.4 Ethnographic Setting**

During the recent prehistory and historic era at least four main Native American cultural groups inhabited portions of the Plan Area. These groups are the Nisenan, Miwok, Northern Valley Yokuts, and southern Patwin.

#### **18.1.4.1 Nisenan**

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According to Kroeber (1932), the west side of the Sacramento River is within or near the southern limits of the Nisenan. Several ethnographic Nisenan villages have been documented along the western bank of the river (see Heizer and Hester [1970] and Johnson and Johnson [1974]). Along with Maidu and Konkow, the languages of the Nisenan people's northern neighbors, the Nisenan language forms the Maiduan language family of the Penutian linguistic stock (Shipley 1978:83).

Wilson and Towne (1978) defined three main subgroups within the Nisenan tribe: Northern Hill Nisenan, Southern Hill Nisenan, and Valley Nisenan. The Valley Nisenan resided adjacent to the northernmost extent of the Plan Area before Euroamerican contact.

Valley Nisenan located their permanent settlements along the riverbanks on elevated natural levees near an adequate food and water supply, in fairly open terrain, with southern exposure preferred (Johnson and Johnson 1974; Beals 1933). Villages ranged from "tribelets" of small extended families consisting of 15 to 25 individuals to larger communities with more than 100 people (Kroeber 1925).

Village sizes ranged from 3 houses up to 40 or 50. Houses were domed structures covered with earth and tule or grass. Brush shelters were used in the summer and at temporary camps during food-gathering rounds (Kroeber 1925:407–408). Larger villages often had semisubterranean dance houses, which were covered in earth and tule or brush and had a central smoke hole at the top. Other common village structures were the sweathouse, used for curing and purification, and the granary, used for storing acorns (Wilson and Towne 1978:388–389).

The smallest Nisenan social and political unit was the family. Each extended family was represented by a family leader, who was called to council by a headman. The headman of the dominant village in a cluster of villages (tribelet) had the authority to call upon the aid of surrounding villages in social and political situations. The headman also served as village adviser, directed special festivities, arbitrated disputes, and acted as an official host (Wilson and Towne 1978:393; Beals 1933:360).

Early Nisenan contact with Europeans appears to have been limited to the southern reaches of their territory, beginning in the early 1800s. Unlike the Valley Nisenan, the groups in the foothills remained relatively unaffected by the European presence until the discovery of gold at Coloma in 1848. In the years following the gold discovery, Nisenan territory was overrun by settlers. Gold seekers and the settlements that sprang up to support them were nearly fatal to the native inhabitants. Survivors worked as wage laborers and domestic help and lived on the edges of foothill towns. Despite severe depredations, descendants of the Nisenan still live in the northern Central Valley and maintain their cultural identity (Wilson and Towne 1978:396–397).

#### **18.1.4.2 Plains Miwok**

The eastern Miwok, and more specifically the Plains Miwok, inhabited the lower reaches of the Mokelumne and Cosumnes Rivers, and the banks of the Sacramento River from Rio Vista to Freeport (Levy 1978:398).

Although the Plains Miwok shared a common language and cultural background, they comprised several separate, politically independent nations, or tribelets (the primary political unit). The tribelet represented an independent, sovereign nation that defined and defended a territory. The tribelet chief, usually a hereditary position, served as the voice of legal and political authority in the tribelet (Levy 1978:410).

The eastern Miwok village comprised various structures. For houses, conical structures of bark were used in the mountains, and conical structures of tule matting were used in the lower elevations of

the central Sierra. Semisubterranean, earth-covered dwellings served as winter homes. Also within the Miwok settlement were assembly houses, sweathouses, acorn granaries, menstrual huts, and conical grinding huts over bedrock mortars (Levy 1978:408–409).

With the arrival of trappers, gold miners, and other settlers to California, the Miwok suffered exposure to introduced diseases. While some hostilities occurred between the Sierra Miwok and miners, other Miwok groups became involved in agricultural operations on the newly developing large land grants. After California was annexed by the United States, some Miwok were displaced to Central Valley locations, yet many remained on the rancherias established in the Sierra Nevada foothills. During the late nineteenth and early twentieth centuries, the Miwok living on the foothill rancherias adapted to new lifestyles, such as seasonal wage labor on ranches and farms, to augment subsistence through hunting and gathering (Levy 1978:400–401). Since the early twentieth century, many persons of Miwok descent survive and maintain strong communities and action-oriented organizations.

### **18.1.4.3 Northern Valley Yokuts**

The Northern Valley Yokuts were the historical occupants of the central and northern San Joaquin Valley. *Yokuts* is a term applied to a large and diverse number of people inhabiting the San Joaquin Valley and Sierra Nevada foothills of central California. The Northern Valley Yokuts' territory extended from near where the San Joaquin River makes a big bend northward to a line midway between the Calaveras and Mokelumne Rivers (Wallace 1978:462).

For the Northern Valley Yokuts, the San Joaquin River and its main tributaries served as a lifeline to the valley, and their villages congregated around these main water sources. They gained much of their livelihood through fishing (in particular, salmon fishing) and varied their diet with waterfowl and the harvesting of wild plant food, such as acorns, tule root, and seeds (Wallace 1978:464).

Most settlements, or at least the principal ones, were built atop low mounds, on or near the banks of large watercourses, for protection against spring flooding (Schenck 1926:132; Schenck and Dawson 1929:308; Cook 1960:242, 259, 285). Settlements were stable and occupied over multiple generations. However, flooding posed the primary threat to a fully stationary existence, and the local rivers, swollen from melting Sierra Nevada snows and heavy rains, periodically overflowed their banks and drove the villagers to even higher ground (Wallace 1978:466).

A headman guided each tribe, and village populations averaged around 300 people. Family houses were round or oval, with a cone-shaped pole frame sunk into the ground and covered with tule mats. Each village also had a community lodge for dances and community functions, as well as a sweathouse (Wallace 1978:465).

The Northern Valley Yokuts suffered great population decline and cultural breakdown when they were drawn into the mission system. Following the mission period, Northern Valley Yokuts continued to clash with the white settlers, and as a result, many villages were burned. The population decline continued through the early American period, as the rich soils of the Delta and valley attracted former miners and other settlers to farming. As they filled up the district, the remaining Yokuts were driven off their hunting and food-gathering lands (Wallace 1978:468–469). As with the Miwok and the Nisenan, however, tribal population has surged in the latter decades of the twentieth century, along with a renewed interest in traditional Yokuts culture. Today, the descendants of the Yokuts live primarily on the Tule River Indian Reservation near Porterville,

established in 1873, and the Santa Rosa Rancheria near Lemoore, established in 1921 (World Culture Encyclopedia 2008).

#### **18.1.4.4 Southern Patwin**

The southern Patwin were a series of linguistically and culturally related tribelets that occupied a portion of the lower Sacramento Valley west of the Sacramento River and north of Suisun Bay. They resided adjacent to the Plan Area and probably used lands within its boundaries. These groups had no common name, but spoke dialects of a single historically related language that extended southward to the Delta. Patwin tribelets maintained their own autonomy and sense of territoriality and typically consisted of one primary and several satellite villages. Villages were located along waterways, often near the junction with another major topographic feature, such as foothills or another waterway. The ethnographically documented villages nearest to the Plan Area were *Aguasto* and *Tolenas*, both situated immediately north of San Pablo Bay to the west-northwest (Kroeber 1925, 1932).

The largest political unit for the Patwin was the tribelet, which consisted of one primary and several satellite villages. Each tribelet had a discrete territory as well as autonomy relative to other social units. While a common language unified these social units, tribelets each had subtle cultural differences relative to one another. Within the tribelet were several political and social distinctions, including a chief who oversaw village activities; this position was passed through inheritance from father to son (Johnson 1978:354).

Patwin villages contained four main types of permanent structures: the dwelling or family house; the ceremonial dance house, which was usually built at a short distance to the north or south end of a village; the sudatory (sweathouse), which was positioned at either the east or the west of the dance house; and the menstrual hut, which was placed on the edge of the village, farthest from the dance house. All of these were earth-covered, semisubterranean structures with either an elliptical or circular shape (Johnson 1978:357–358).

The principal subsistence activities of the Patwin were hunting, fishing, and the gathering of wild plants. Along with the acorn, the primary staple, the Patwin gathered buckeye, pine nuts, berries, wild grapes, and other plants. Each village had its own location for these food sources, and the village chief oversaw the procurement of food for the village (Johnson 1978:355).

Population estimates for Patwin groups, from precontact until 1833, are more than 15,000 (Kroeber 1932; Cook 1955). The Patwin were in contact with the Spanish missions by the late eighteenth century, and some of the earliest historic records of the Patwin are found among mission registers of baptisms, marriage, and deaths of Native American neophytes. Mission San Jose, established in 1797, along with Mission Dolores, actively proselytized Patwin from their southern villages, and Mission Sonoma, built in 1823, also baptized neophytes, until the secularization of all missions by the Mexican government in 1832–1836. Afterward, many tribal territories were divided into individual land grants (Johnson 1978:351).

The U.S. conquest of California (1846–1848) was followed by a massive influx of American settlers into Patwin territory. To facilitate the development of ranching, agriculture, mining, and large settlements, the Patwin were usually moved to reservations. However, some Patwin assimilated themselves, at least partially, into white culture by working as ranch laborers (Johnson 1978:351). Today, some Patwin descendants live on the Colusa, Cortina, and Rumsey Rancherias; although many of the people living on these rancherias are of general Wintun descent.

## 18.1.5 Native American Property Types and Traditional Cultural Properties

Native American property types, often termed traditional cultural properties (TCPs), within the Plan Area are typically associated with resource procurement activities along the waterways of the Central Valley, Delta, and adjacent foothills. Such properties derive their significance not from the property itself, but from the role the property plays in the cultural practices or beliefs of an extant community or identifiable social group. Examples of TCPs range from expansive geographic areas such as the Sutter Buttes and Mt. Diablo to individual locations associated with beliefs or practices that are of traditional cultural significance. A TCP is defined generally as a property that is associated with cultural practices or beliefs of a living community that (a) are rooted in that community's history for at least 50 years and (b) are important in maintaining the continuing cultural identity of the community (National Park Service 1998:1). Such properties have not been identified within the Plan Area; however, there is a possibility that plant-gathering, fishing, and ceremonial and sacred sites that may occur in the Delta qualify as TCPs. Examples of TCP types are described under separate headings below. Individual TCPs can qualify for listing in the NRHP if they meet the criteria described in *National Register Bulletin 38* (National Park Service 1998). The TCP must retain the characteristics associated with its traditional use (integrity of condition) and still perform the traditional cultural function for which it is significant (integrity of relationship) (National Park Service 1998:11–12). The resource must also meet the criteria for listing in the NRHP (National Park Service 1998:12).

### 18.1.5.1 Plant-Gathering Areas

Many Native American groups gather the same plant resources that have been used by their people for centuries. Some gathered resources are used for subsistence or medicine, but Native Americans who currently practice traditional plant gathering focus more on materials for producing baskets and other items. Typical resources gathered for food include acorns, buckeye nuts, wild onion, and wild sweet potato. Resources gathered for materials include tule, willow, and various native grasses.

### 18.1.5.2 Fishing Locations

Fishing played an important role in the lives of Native Americans within the Plan Area. Some Native American groups still procure fish (particularly salmon) using traditional methods, including weirs, nets, harpoons, and traps. There may be areas where Native American groups still practice these traditional procurement methods within the Plan Area.

### 18.1.5.3 Ceremonial and Sacred Sites

Some areas regarded as sacred by Native American groups are still used for ceremonial purposes. These areas are typically associated with an event or a viewshed of particular importance. Often, these are ancient village sites or meeting sites where tribal leaders from the region would gather, or sites with views of areas important to their religious beliefs.

## 18.1.6 Historic-Era Setting

The following section summarizes the historic context developed in the technical report supporting the findings of the built-environment field survey. A more detailed discussion of the Delta's history



can be found in the technical report [*in progress—completion anticipated prior to public draft*]. The Delta's historic-era built environment is largely the product of agricultural and residential development, as well as fishing, canning and other industrialized produce processing. These were facilitated by land reclamation and by transportation development, the latter of which initially depended on Delta waterways but eventually served to surmount those waterways. The Delta's built environment has also been shaped by large-scale flood control and water management efforts, as well as recreational activities such as fishing and boating.

#### **18.1.6.1 The Spanish Era to the Gold Rush**

The first Spanish expedition to reach the Delta was led by Captain Pedro Fages in 1872, and it did not spark interest in colonizing the region. Instead, the Spanish presence in California remained concentrated mainly along the coastal strip of missions and *presidios*, the nearest of which was located west of the Delta. During the early nineteenth century Spanish and Mexican soldiers sometimes entered the Delta region on incursions to capture Native Americans converts who had fled missions. When Mexico achieved independence from Spain in 1822, California became a territory of Mexico, but remained a remote frontier province. By the end of the decade, American fur trappers began to enter the San Joaquin Valley and the Delta after hearing reports of abundant beaver that circulated after Jedediah Smith's trapping expeditions through central California in 1827 and 1828. Fur trapping in and around the Delta resulted in a steep decline of beaver populations, and fur trappers introduced diseases in the region that also heavily affected Native American tribes. (Owens 1991:15; Sandos 2004: 1-13, 99-103; Thompson 1957: 88-90, 94-109.)

By 1848, when gold was discovered at Sutter's mill in Coloma, only a handful of people had settled in the Delta, but thousands of newcomers traveled Delta waterways on route to the foothill and mountain mines to the east. Sacramento and Stockton developed as shipping centers and stopovers for the mining economy. Some California newcomers made the sometimes lucrative decision to forego mining and produce food to feed the growing population of miners. Farmers began to work land at the edge of the Delta, along the natural levees of the major rivers draining into it. Known as "rim landers," these early settlers built so-called *shoestring levees* atop the natural levees to withstand the highest tidal rises. Later, more extensive levee construction downstream would transform the Delta. (Paul 1973: 19-20; Street 2004: 117; Thompson 1957: 133-46.)

#### **18.1.6.2 Land Reclamation**

The so-called Swamp Land Act of 1850 and subsequent creation of the State Board of Swamp Land Commissioners enabled groups of small landholders to establish districts to undertake Delta land reclamation. Lack of cooperation among small landholders and new legislation allowed most Delta agriculture to be dominated by wealthy absentee owners rather than modest independent farmers. Two large firms formed in the 1860s, George Roberts's Tide Land Reclamation Company and Morton Fischer's Glasgow-California Land and Reclamation Company dominated Delta reclamation into the late nineteenth century. Speculative, large-scale land reclamation brought thousands of Chinese workers to the Delta. Their labor first enabled the construction of levees and then helped the islands created by such reclamation efforts yield abundant produce. (Garone 2011: 113; Kelley 1989: 60; Lund et al. 2007: 20; Owens 1991: 19; Thompson 1957: 198-202, 225.)

Reclaimed lands required constant and expensive maintenance and repair. Levees frequently failed and islands flooded. Sacramento and San Joaquin River beds were raised and choked by tailings from hydraulic mining in the Sierra Nevada Mountains, which was outlawed in the mid 1880s but

had a longer lasting impact on rivers. The floors of the Delta's peat land islands frequently underwent subsidence, causing groundwater seepage to create new marsh areas. Upstream irrigation draws caused saltwater intrusion deeper into the Delta. Technology helped landowners overcome some of these problems. The introduction of clamshell dredges in 1879 enabled the construction of increasingly larger and more secure levees. Modern pumps and the introduction of electricity allowed for more efficient and thorough draining of flooded islands. By the early twentieth century, the rise of industrial agriculture across the Delta increased pressure for state and federal action to protect and facilitate the region's agricultural economy through flood control efforts, transportation development, and large-scale water policy and development in the early twentieth century. (Garone 2007: 155; Thompson 1957: 226-272; Thompson 2006: 48, 55, 65.)

### **18.1.6.3 Agriculture**

Agricultural activity initially took place on higher lands near natural levees and rises along the Sacramento River, where farmers raised potatoes, onions, and beans, among other crops, and grazed cattle and sheep. By 1852 the banks of the lower San Joaquin River were almost entirely occupied by small-scale farming operations as well. From the 1860s through the 1880s, reclamation spread agriculture from alluvium lands upstream into the peat lands of the central Delta. Growers typically planted newly reclaimed islands in grains, especially wheat. With water access to a growing urban market in San Francisco, Delta agriculture boomed and crops were diversified. By 1883, large tonnages of vegetables were being shipped to San Francisco in steamers that allowed Delta vegetables and fruit to be sold a day after they were harvested. Over time, dairies, Bartlett pear orchards, and asparagus became important components of the Delta economy. (Lokke and Simmons 1980: 223-224; Rawls and Bean 2002: 201-02; Thompson 1957:139-44; Thompson 2006: 52, 56, 61-63.)

On land created by large-scale speculative reclamation, patterns of Delta agriculture production usually bore little resemblance to the image American farm worked and owned by an independent Anglo-American farmer. Large land holdings were divided into agricultural "camps" with a resident superintendent. American-born Delta farmers tended to be engaged in grain, orchard, and livestock husbandry as lessees, farm managers, and in a few cases, independent farmers. They sometimes subleased to ethnic entrepreneurs who then arranged to have members of their ethnic communities work the land. Chinese, Italian, and Portuguese tenant farmers often specialized in garden or truck farming. Chinese agricultural laborers also became associated with row crops, especially nineteenth-century potato cultivation. In the twentieth century, Japanese farmers frequently engaged in potato and asparagus production. Japanese entrepreneurs George Shima and Hotta Kamajirō built agricultural empires, but most Japanese farmers were hampered with discriminatory laws that barred them from land ownership and eventually barred leasing land as well. Beginning in the 1920s, Filipino and Mexican day laborers also worked Delta lands. (Azuma 1994: 14-20; Miller 1995: 180-182; Thompson 1957: 300-02, 305-06, 309-10, 312-14, 331, 335.)

Technological advances in the first decades of the twentieth century signaled the arrival of modern industrial farming after World War I. "Caterpillar" tractors became commonplace in the Delta, particularly among the large land companies. Although large acreage continued to be reclaimed, a good deal of island land was improved through the introduction of electric pumps. The sale of field crops by consignment to wholesale markets or shippers nurtured the rise of canneries and wholesale produce houses with product standards and field buyers. Adding to the Delta's industrial built environment of salmon canneries developed in the latter nineteenth century were new industrial complexes resembling urban factories, which often employed ethnic laborers to help

make sugar out of sugar beets or can fruit, asparagus, and other vegetables. (Armentrout-Ma 1981: 149; Thompson 1957: 281, 296-98, 312, 314-18, 343-44.)

#### **18.1.6.4 Transportation Development**

During the Gold Rush, most Americans who encountered the Delta did so as passengers of sailboats and steamers en route between San Francisco and the mines east of the Delta. A few trails and later roadways complemented the water traffic. Only after the start of the twentieth century did roads begin to dominate traffic in the delta with the introduction of the automobile and truck. Ferries connected roads with agriculture on remote islands. Anxious to retire their ferries, Island owners convinced county governments to take over their operation and maintenance. Ferries were always a short-term solution to a transportation problem, and most land owners awaited local, state, or federal investment in bridge construction to connect them more directly to markets. Nevertheless, ferry boats still operate at the Empire Tract, Woodward Island, and connecting Jersey Island with Bethel Island, among others. Early trails evolved into roads traveled by stages hauling freight back and forth between the farms and the small towns that took shape behind recently constructed levees. Railroads also played an important role in the development of agriculture, especially after the beginning of the twentieth century. The San Joaquin Railroad was completed across the Delta in 1897 and purchased by Atchison, Topeka, & Santa Fe in 1898. Originating primarily in Antioch, Stockton, and Sacramento, steamboats plied the waterways on set schedules dropping off workers and supplies and transporting harvested crops. (Daggett 1922, 122: 334; Thompson 1980: 145-147.)

After 1900, county and state investment nurtured bridge construction, which in turn enabled the development of year-round roads serving Delta residents and visitors. During the first decade of the twentieth century, the construction of steel draw and swing bridges across Georgiana Slough, both the North and South Forks of the Mokelumne River, and the Sacramento River below the head of Grand Island, provided for road connections from Walnut Grove and Brannan, Andrus, and Grand Islands to the population centers of Sacramento and Stockton. During the 1910s and early 1920s, additional bridge construction and road development connected the era's increasing automobile traffic from the earlier established roads to new routes extending to Isleton and Rio Vista. In 1915 the American Bridge Company completed the Middle River Bridge, currently the second oldest steel swing bridge in California. This bridge facilitated development of the southern Delta's Borden Highway, or State Route 4 between Stockton and Contra Costa County. By 1922, the completion of River Road through the northern Delta allowed motorists to travel from Stockton and Sacramento across the northern Delta to Vallejo. Constructed in 1926 to replace a major ferry crossing, the American Toll Bridge Company's Antioch Bridge provided for completion of the Victory Highway route, which crossed the Delta to connect Sacramento and the East Bay via Antioch. No longer extant electric interurban railroads also extended into portions of the Delta during the early twentieth century. (Blow 1920: 226; Caltrans 1990: 116-17; Thompson 1980: 151-54, 163.)

#### **18.1.6.5 Community Development**

During the mid nineteenth century, Sacramento and Stockton took shape east of the Delta and became the most important supply ports and trading centers of the central California interior, dwarfing the small and modest-sized agricultural shipping hubs and processing centers that developed into Delta communities. Some of these Delta towns—Courtland, Rio Vista, Isleton, Knightsen, and Byron—are located outside but in the vicinity of the study area. These communities are discussed below because historically, residents of nearby properties within the study area likely

#### Cultural Resources

identified themselves as members of those communities even while living on their peripheries. Hood, Locke, Holt and portions of Clarksburg and Walnut Grove are located within the study area.

Clarksburg was established in 1850 in the northernmost Delta as a commercial fishing community along the Sacramento River. The river banks north of Clarksburg attracted Portuguese settlement in what came to be known as the Lisbon District. The American Crystal Sugar Company developed a sugar refinery north of Clarksburg in the 1920s that continued to operate into the mid twentieth century. The community of Courtland was established on Randall Island approximately six-and-a-half miles south of Clarksburg along the east bank of the Sacramento River in 1867, when a post office was moved there from Onisbo across Steamboat Slough. Fruit production and other agricultural activity on Randall, Grand, and Sutter islands initially drove the town's economy. Encompassing wharves, a hotel, and stores, Courtland experienced continued growth after 1900 as asparagus became the dominant crop. Unlike other Delta landing settlements, Courtland sent its fruits and vegetables to Hood for canning and other processing. Initially known as Richland, Hood was established in 1860 as a river landing with a warehouse and school house serving nearby agricultural producers. Located nearly seven miles southeast of Courtland, Walnut Grove was founded in 1851 by John W. Sharp. By the end of the 1870s the town had a post office, hotel, schoolhouse, meeting hall, sheltered wharf, and warehouses. The construction of nearby bridges and ferry services linked Walnut Grove to other towns as asparagus production boosted the local economy in the twentieth century. (Gregory 1913: 158; HARD Townsite Team 2007: 79-80; Reed 1923: 121; Thompson 1957: 427-28, 431.)

Located approximately 11 miles southwest of Walnut Grove Rio Vista was founded by members of the Brazos del Rio ("Arms of the River") community that flooded in 1861. Displaced Brazos del Rio residents established the new town on the ranch lands of Joseph Bruning adjacent to the Montezuma Hills. Rio Vista became a major wheat producer as well as an important shipping center. Between, 1868 and 1878 population within a ten mile radius of Rio Vista grew from 200 to 1,500. At the turn of the century, Rio Vista's wharf was the Delta's busiest. Cannery operations began in Rio Vista in 1904. The river on the east side of the town was spanned in 1918 by a bridge to Brannan Island. Four miles east of Rio Vista, Isleton was founded in 1874 by Dr. Josiah Pool as an agricultural service town and shipment landing. By 1878, the bustling town had a city hall, a water company, a warehouse, a hotel, a grange hall, two saloons, a blacksmith's shop, several stores, and a commercial ferry that ran to Grand Island and Rio Vista. During the twentieth century, Isleton became a center of asparagus and other vegetable canning, including the Libby, McNeal & Libby operations. (HARD Townsite Team 2007: 79; Thompson 1957: 429-30; Thompson 2006: 63-65.)

Most of these northern and central Delta communities included Asian immigrant enclaves. Chinatowns comprised of two-story wood-frame buildings took shape in Walnut Grove, Isleton, Courtland, and Rio Vista during the late nineteenth century. Delta Chinatowns housed workers and high status bosses and merchants, and included vice-oriented venues such as opium dens, brothels, and gambling halls. After fire burned Walnut Grove's Chinatown in 1915, members of the community's ethnic Chungshan population—who were prohibited from owning land under the California Alien Land Act of 1913—leased nine acres north of Walnut Grove from George Locke and established a new Chinatown that became known as Locke. Locke residents created an unusual mix of traditional Chinese building patterns and Delta vernacular architecture in the two-story buildings overhanging Locke's 12-foot-wide main street. In the early twentieth century, Japanese immigrants and their Nisei offspring settled in and farmed the Delta in increasing numbers. Limited by the alien land laws barring Japanese land ownership, Japanese farmers nevertheless established new ethnic

enclaves in Delta towns such as Walnut Grove and Isleton. (Charleton 1990: 23-25; Hoover et al. 1990: 314-315.)

Towns established within and in the vicinity of the southern APE include Holt, Knightsen, and Byron. Located approximately seven miles west of the Stockton embarcadero is Holt, a small enclave established as a freight-car loading point along the Atchison, Topeka, and Santa Fe Railroad (Santa Fe) line completed in 1897. Holt was named for brothers Benjamin and Frank Holt, who founded Stockton's Holt Manufacturing Company. Byron was established along the Southern Pacific Railroad line in 1878 approximately 12 miles southwest of Holt. Wheat farming initially drove Byron's economy. Water from the Byron-Bethany irrigation district (1915-16) helped diversify the town's agricultural output with almond, walnut, alfalfa and dairy production. Knightsen was founded along the Santa Fe Railroad line at seven miles north of Byron in 1899. The town's agricultural activity featured celery, dairy, and silkworm production. By World War I Knightsen consisted of residences, a store, blacksmith shop, garage, and a saloon. (Hoover et al. 2002: 68, 370-71; Hulanski 1917: 404-05, 426-28; Thompson 1957: 411, 416, 425; Tinkham 1923: 339-40.)

### **18.1.6.6 Water Management**

The Delta became a focal point of increasingly large-scale water engineering and management during the early twentieth century. Pressure to ameliorate ongoing flood threats due to the legacies of hydraulic mining led to 1917 legislation creating the first federal control project. The plan included nearly two hundred miles of levees, several hundred miles of bypass channels, and ultimately the rerouting of floodwaters of the Sacramento, Yuba, and American Rivers. Large dredges in use in the Delta for decades were now employed to build new levees and create channels for flood control.

Numerous canals and straightened and widened river channels were by products of the islands and levees created by Delta reclamation. These functioned as an important water source for irrigation and provided both recreational boating waterway and dredge access for levee construction and maintenance. The simplest and most cost-efficient method by which to obtain levee material was to dig a large ditch and build a berm on one side (the levee), with the ditch filling in with Delta waters on the other side (the canal). Late nineteenth century dredges were capable of moving up to 400 cubic yards of earth per hour. The use of similar dredges across the Delta explains the similar appearance of many of the canals throughout the Delta. Most Delta canals appear to have been opportunistically created rather than being formally engineered, hence no design or "as-built" drawings for early canals and levees have been located. Nevertheless, with federal involvement in flood control after 1917, and especially in the 1920s, plans were drawn and implemented for standard levees and canals for both the Sacramento and Mississippi deltas. (Kelley 1989: 252, 288-291; Mowry 1951: 152; Pisani 2002: 255.)

California's great Central Valley and many smaller valleys to the west and south had abundant land but lacked the water resources necessary for expanded agriculture. The federal Newlands Reclamation Act of 1902, improvements in irrigation technology, and improving transportation technology and networks all held out promise for agricultural expansion in California. Limits on water availability remained the major hindrance to such expansion. After World War I, groundwater levels dropped under drought conditions, and saltwater reached east into the Delta as far as Courtland. At the end of the 1920s, state engineer Edward Hyatt developed a State Water Plan to respond to growing water problems. In 1928 the state's voters approved a constitutional amendment that limited the holders of riparian water rights to reasonable use of their water, which

opened the way for the state legislature to pass the Central Valley Project Act in 1933. The Department of Interior's Bureau of Reclamation ultimately took responsibility for the Central Valley Project (CVP) at the behest of Congress. The project included pumping plants that would divert Sacramento River water southward through a series of canals linking with the Delta-Mendota Canal, which was designed to replace water diverted from the San Joaquin River at Friant Dam in the southern Sierra Nevada. Most of the Central Valley Project was completed by the early 1950s, including more than 500 miles of canals and 20 dams and reservoirs. After World War II, the state's Water Resources Control Board began planning for additional large-scale water management projects. Then state engineer Arthur D. Edmonston developed a state water plan entailing major new water impoundment and conveyance development. Known as the State Water Project (SWP), Edmonston's plan promised to augment flows to the Delta during dry years and develop state-funded canals to convey additional water to the San Joaquin Valley and new supplies to Santa Clara and Alameda Counties. The plan also called for the development of pumps to transmit Delta water to what would become known as San Luis Reservoir and to a huge aqueduct conveying water south to be pumped over the Tehachapi Mountains into Southern California. In 1960 voters approved the financing for the project, and the first phase was implemented between 1962 and 1971. (Cooper 1968: 50-52; Kahrl 1979: 46-51; Kluger 1992: 85-99; Rarick 2005: 205-228.)

#### **18.1.6.7 Recreation**

Wild game and abundant fisheries have attracted people to the Delta for millennia, but with the arrival of Jedediah Strong Smith and other Americans in the first half of the nineteenth century, market hunting and commercial fishing began to dominate the marshes. By the end of the century, however, several factors contributed to a change in emphasis from market to non-sale game and from commercial fishing to sport and recreation. In addition, investors reclaimed swamp land faster than the same could be put to productive agricultural uses, opening large areas for alternative uses, including recreation. By the first decades of the twentieth century the Delta became a haven for sportsmen and by the 1920s, with the construction of year-round roads and bridges, hotels and campsites, it had become a destination for the recreational driver, the car camper, and the sightseer. In the post-World War II era, the widespread development of tract housing bypassed the Delta, primarily due to land ownership patterns, limited transportation options, and the overabundance of water. At the same time, those factors helped to foster an increased demand for recreational opportunities and the proliferation of house and party boats. Recently, wetlands restoration has made the Delta a destination for bird watchers as several communities have embraced rare and endangered birds. (DWR 1993; Schell 1979: 196; Gardner 1964: 8-19; Steienstra 2012: 289; Thompson 1957: 58; Young 1969:1)

### **18.1.7 Historic-Era Built Environment Property Types**

This section outlines property types and subtypes known to be located in the study area. The property types are organized chronologically, according to the historical themes that generated these resources. Surveyors recorded built environment resources were 45 years old or older. These structures range from mid-to-late-nineteenth-century wood-frame Delta residences to properties constructed in roughly the middle of the 20<sup>th</sup> century. Specific property types include buildings, structures, districts, landscapes, transportation facilities, and reclamation and flood management buildings and structures. This section provides a general description of these property types known to be located in the study area.

Relatively few nineteenth-century buildings have been identified in the study area, reflecting both the sparse settlement during that century and the vast changes that have occurred in more recent decades. These scarce nineteenth-century buildings are more valuable for their rarity. However, the development of communities in the Delta during the twentieth century is represented by a variety of building property types. Residential and agricultural buildings make up the bulk of these properties in the study area, but there are also a moderate number of commercial and industrial buildings within the study area that illustrate equally important components of this development.

### **18.1.7.1 Residential Buildings**

Residential buildings constructed in the nineteenth century are scattered throughout the region. These residences exhibit Anglo-American and vernacular styles. Many of the buildings in the Delta reflect adaptation to local conditions such as flooding, as well as the adherence to design and structural forms consistent with the larger architectural style. One example of conformity within architectural design can be seen in what are commonly referred to as “river homes,” or “Delta homes.” These two-story buildings were often built within feet of levees and below the river level. Some of the finest examples are located in the study area along River Road, the meandering State Highway 160 atop the Sacramento River levee. The second stories of these homes frequently extended beyond the height of the levee, and in the event of a flood, it is customary for the occupant to open all doors and windows on the ground floor, and retreat to the dry, second floor.

Many of the relevant styles fall into the picturesque movement, including the romantic, Gothic revival, Greek revival, Italianate, and Victorian styles. These nineteenth-century homes are found on farms, smaller ranchettes, and in small towns throughout the study area. They also span a wide socioeconomic range, from modest vernacular cottages in the smaller towns to grand Beaux Arts mansions on the pioneering farms and ranches. The urban homes are generally built in the same styles as the rural homes and are typically cottages on small residential parcels that may also include a garage, fences or walls, and landscaping. Homes on farms and ranches may be contributors to rural historic landscapes, the evaluation of which involves consideration of the property as a whole, including residences as well as other ancillary buildings, structures, circulation systems, and boundary demarcations.

Residential buildings in the Delta constructed during the twentieth century include Craftsman-style bungalows, and Foursquare, Colonial Revival, Spanish Colonial Revival, Minimal Traditional, Ranch-style residences. These buildings were mainly constructed during the first half of the twentieth century in urban, rural, and suburban settings. The grand period revival farm and ranch mansions from the 1910s and 1920s represent some of the more striking property types. Rural homes also typically exist within a cluster of farmstead buildings, from barns to packing sheds to equipment sheds, and tank houses. House boats and floating cabins exist along several of the major sloughs within the study area. It is not uncommon to see dilapidated homes (at times reclaimed by the Delta’s waterways), sheds, and general agricultural infrastructure in a variety of massing and scale.

Urban properties exist in the small towns, such as Clarksburg, Hood, Locke, and Walnut Grove. With rare exceptions, the urban properties lack the fine design of the grand rural properties. Suburban development dates almost exclusively to the post-World War II era. Homes in small suburban riverfront enclaves best reflect the ranch style and other mid-century modern styles.

### **18.1.7.2 Commercial Buildings**

Commercial buildings located within the study area include a range of compositional types representing a variety of economic activities. Commercial buildings include stores, banks, agricultural vendors, and office buildings, and are typically one-part commercial block buildings with moderately decorative facades and stepped parapets. Commercial buildings, with rare exceptions, exist in the small towns as well as the larger communities. Twentieth-century commercial buildings in the rural Delta occur almost exclusively in the small towns, including Clarksburg, Hood, Locke, and Walnut Grove. Although generally small in scale (reflecting the modest scale of commercial activity), these buildings mimic the design of commercial buildings in bigger cities. The few nonurban commercial buildings in the region comprise roadside or waterfront service buildings, such as stores and restaurants.

### **18.1.7.3 Agricultural Properties**

Several property types within the study area are associated with the historical theme of agriculture. The infrastructure of agricultural properties includes individual ranchettes, large orchards and pastures, labor camps, and processing facilities, each of which include a consistent assemblage of mostly utilitarian buildings and structures that provide explicit functions.

Agricultural buildings and structures within the study area include residences, barns, tank houses, shed outbuildings, grain silos and elevators, culling chutes, corrals, fences, and irrigation or drainage ditches. The majority of these resource types date primarily to the early twentieth century and reflect a broad range of architectural styles, from period revival mansions to vernacular barns, tank houses, and weathered storage sheds. Of these architectural types, the most prominent agricultural structure found within the study area is the gable-roofed barn. These barns share similar characteristics, including moderately steep gables, tall sidewalls, rectangular massing, and post and beam construction.

### **18.1.7.4 Historic Districts**

In addition to individual buildings, cultural resources can include historic districts. The National Park Service defines *historic district* in *National Register Bulletin 15* as possessing “a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development” (National Park Service 1987:5). Examples of NRHP listed historic districts include Locke and portions of Walnut Grove. These districts each contain a cluster of buildings that are connected by similar themes of Asian-American settlement and agriculture in the Delta. While these historic districts include a few nineteenth-century residences and commercial buildings, they are dominated by buildings constructed during the first few decades of the twentieth century. These districts reflect a wide range of functional building types, including residential buildings, agricultural buildings and structures, and commercial buildings. Districts also include scattered industrial buildings generally associated with food storage or processing.

Districts are not limited to urban settings. South River Road, in the vicinity of Clarksburg, has a series of late-nineteenth and early-twentieth-century grand rural homes associated with agriculture that collectively could be considered a district. Also identified on South River Road are a series of “river” or “Delta” homes built between 1855 and 1875. These modest vernacular buildings are associated with early Portuguese settlers and comprise what is known in the region as the Lisbon District.



### **18.1.7.5 Reclamation and Flood Management Structures**

The single greatest factor advancing settlement in the Delta was the reclamation of land and the introduction of flood-management systems that shaped the landscape to accommodate the agricultural development that still characterizes the region. The entire Delta's natural landscape was significantly altered and many features of these introduced systems are extant. Compared to many built resources in the region, reclamation and flood-management structures have had minimal consideration as historical resources.

Typical structures associated with reclamation and flood management include levees, canals, and land-side irrigation and water conveyance infrastructure such as ditches, pump houses, and other structures that support reclamation and agriculture on reclaimed uplands. These structures range in sophistication from shoestring levees built in the nineteenth century, which required frequent repair and reconstruction, to the canals built by the Bureau of Reclamation and the DWR, which are among the largest and most highly engineered water conveyance structures in the nation.

Diversion structures include weirs, either steel or wood, such as found at the Bureau of Reclamation's fish protective facility at the Clifton Court Forebay. Pumping facilities of varying sizes are used to move water from where it is in excess to where it is needed. These range from the massive plants at Banks and Tracy Pumping Plants, to the mid-sized Middle River pumping plant, and to the single pumps that line the levees throughout the study area. Conduits such as canals, flumes, tunnels, and pipelines used to convey water are found throughout the study area. They range from simple dirt-lined ditches found on virtually every agricultural parcel to the three pipelines that make up the massive Mokelumne Aqueduct. Smaller pipelines with siphons, penstocks, gates, valves or other distribution and regulation structures are found throughout the subject area.

### **18.1.7.6 Transportation**

One of the direct results of settlement was the development and improvement of the transportation infrastructure in the Delta. During the nineteenth and early twentieth centuries, several railroads were constructed through the region, roads were improved, and bridges were constructed to ensure efficient delivery of produce grown in the Delta region to major markets.

#### **Railroads**

Railroads were important in the creation and economic success of many Delta towns. Relevant railroad systems in the Delta include the Southern Pacific Railroad; Atchison, Topeka, and Santa Fe Railway; San Pablo and Tulare Railroad; Sacramento Southern Railroad; Oakland East Bay and Antioch Railroad; and Electric Northern Railroad. The Atchison, Topeka, and Santa Fe Railway line, originally constructed in the late 1890s, now carries the Burlington Northern & Santa Fe as well as Amtrak's *San Joaquin*. Running generally east from the Antioch area, the line passes between Bacon and Woodward Islands before crossing the Middle River Bridge, opened in 1929.

#### **Roads**

During the second half of the nineteenth century, early roads in the Delta were built over old trails that ran along the tops of river levees. One of the first public roads established in the Delta was Georgiana Road, which paralleled the east bank of the Sacramento River from Freeport to Walnut

Grove and eventually to Sherman Island by 1870. Historic road alignments traverse the Delta and form one of the property types that may be affected by the project options.

## **Bridges and Ferries**

Bridges have been an important element in the transportation network of the Delta since the nineteenth century. Because these bridges often cross navigable waterways, their builders were required by law to provide the means of accommodating river traffic, until recently by constructing movable bridges. This was true of highway bridges as well as railroad bridges. There are dozens of movable spans in the study area, most dating to the early decades of the twentieth century. These include single-leaf as well as double-leaf bascule bridges. They also include a large number of center-pivot swing bridges. Owing to the presence of numerous railroad and highway lines in the region, the Delta is home to the majority of all movable spans in California. Since the end of World War II, the trend has been to construct high bridges that allow river traffic to pass without interrupting highway traffic.

For less significant crossing, ferries were often built to carry automobile traffic over navigable waters. Most of these were simple cable ferries, capable of carrying only a small number of vehicles at a time. San Joaquin County operated as many as 16 ferries at one time. Several of them are still in service including one connecting the Upper Jones Tract with Woodward Island, and the Empire Tract-Venice Island Ferry. The Caltran-operated J-Mack ferry operates on Highway 220 at Ryer Island and Howard's Landing.

### **18.1.7.7 Utility Infrastructure**

The growth and development of towns throughout the Delta necessitated the development of utility infrastructure. Documented historic-era utility infrastructure in the study area is related primarily to electrical transmission (e.g., transmission lines, yards, substations). This infrastructure can be found throughout the study area, with features and elements spanning the 1910s through the 1950s.

### **18.1.7.8 Historic Rural Landscapes**

Cultural resources do not always consist of individual sites, buildings, structures, or features. They can also encompass landscapes, including those in rural contexts, such as those found throughout the Delta. According to the National Park Service *National Register Bulletin* 18 (Keller and Keller 1987, further described in Appendix 18A), a *rural historic landscape* is defined as

a geographical area that historically has been used by people, or shaped or modified by human activity, occupancy, or intervention, and that possesses a significant concentration, linkage, or continuity of areas of land use, vegetation, buildings and structures, roads and waterways, and natural features. Rural landscapes commonly reflect the day-to-day occupational activities of people engaged in traditional work such as mining, fishing, and various types of agriculture. Often, they have developed and evolved in response to both the forces of nature and the pragmatic need to make a living.

Such landscapes have been identified and evaluated in the Delta. The most notable example is Bacon Island; the entire island has been designated an NRHP-eligible Rural Historic District. Although large-scale agriculture is clearly still the predominant industry and way of life in the Delta, the social, ethnic, technological, and economic context has changed dramatically since the early 1900s, and few such complexes retaining a high degree of historical integrity have been recorded in the Delta. Rural

historic landscapes can include constituent elements of all the various property types from the historic era.

## **18.1.8 Historic Archaeological Property Types**

Previous studies in the vicinity of the Plan Area provide reasonable expectations of the range of historic archaeological property types relevant to the BDCP. These property types are classified here in terms of function. Intensive historic-era use of waterways within the Plan Area coincides with the discovery of gold in 1848. The sudden influx of fortune seekers resulted in heavy use of waterways within the Plan Area for transportation of individuals and supplies. To accommodate the surge, cities and towns were established along the rivers. Both small- and large-scale mining endeavors were carried out in the Plan Area vicinity along the Feather, Bear, Yuba, and American Rivers. Agricultural endeavors followed quickly, and overland transportation routes were developed that often paralleled waterways in the Plan Area. Historic archaeological resources within the Plan Area are mostly related to these events. Six categories of historical archaeological property types have been identified within the Plan Area and are described under separate headings below.

### **18.1.8.1 Building Foundations**

This property type is typically related to either commercial or residential structures that have been demolished or burned down. Foundation materials can include stacked rock, wood, brick and mortar, and concrete. There are often associated structural remains such as plate glass, nails, and other hardware in the vicinity. Associated domestic refuse deposits are common, as well as subterranean wells and privy pits. In the Plan Area, many examples of this site type are associated with farming and ranching.

### **18.1.8.2 Refuse Scatters/Dumps**

This property type can range from a single dumping episode to an established community dump. Associated artifacts include glass bottles and jars, ceramics, metal cans, and a multitude of other domestic items. Many examples of this site type represent the remnants of labor camps and townsites.

### **18.1.8.3 Transportation-Related Features**

This property type includes roads, railroads, and landings for water vessels. Roads and railroad lines were often established on the crown of levees that parallel waterways in the Plan Area. Public landings were often established for towns, but many were associated with private properties. Landings associated with private property were typically used for loading and unloading of materials and livestock associated with agricultural endeavors.

### **18.1.8.4 Water Conveyance Systems**

This property type consists of both small-scale systems, such as ditches, canals, and pump house foundations, and large-scale systems, such as levees, sloughs, and weirs. Small-scale water conveyance systems are typically associated with irrigation for agricultural endeavors.

#### **18.1.8.5 Historic Isolates**

Isolated finds are three or fewer artifacts that occur within a restricted spatial context, generally within an area 30 feet in diameter. Information potential usually is limited to location, material type, style, and function of the individual artifact.

#### **18.1.8.6 Maritime/Riverine Property Types**

The variety of riverine and maritime resources in the Plan Area provides a reasonable prediction of the range of maritime/riverine property types that may be affected by the action alternatives. These property types are classified here in terms of function because of the wide variation in form.

Maritime/riverine resources are typically associated with historic-era activities, although there is a small possibility of submerged prehistoric resources. Use of the waterways in the Plan Area for commercial, military, and recreational endeavors has been intensive since the 1840s, resulting, for various reasons, in numerous maritime/riverine properties. Previous cultural resources studies in the Plan Area have identified a few maritime/riverine property types. Maritime/riverine resource property types include the remains of landings, pilings, and modern and historic vessels. Each property type is described under a separate heading below.

##### **Landings**

This property type includes wooden structures used for docking vessels to load and unload people, livestock, and materials. Public landings were often established for towns, but many were associated with private properties. Landings associated with private property were typically used for loading and unloading materials associated with agricultural endeavors. As overland transportation became more common, use of the waterways declined and landings fell into disrepair, often resulting in their collapse into the water.

##### **Pilings**

This property type was often associated with landings or structures built along the riverfront. Pilings are wood or concrete poles driven into the river bottom to support the associated structure, but they were sometimes used individually for the mooring of vessels. Many pilings in the Plan Area have fallen into disrepair and sunk, although some are intact and being used for mooring.

##### **Vessels**

A wide range of submerged vessels dating from the 1840s to the present can be found in the Plan Area. The earliest vessel types included small and large sailing vessels and barges, typically with wooden hulls and metal hardware. These vessels were usually associated with commercial endeavors because recreational boating was not common until the 1930s. Wooden barges in the Plan Area were typically “dumb” barges (i.e., no built-in means of propulsion) and were used for transporting produce while tethered to a wind- or steam-powered vessel. Steel hulls became more prominent after the 1860s and are typically steamboats, barges, fishing vessels, or military vessels. Modern vessels are most often recreational and are made of fiberglass and wood or steel composite.

### **18.1.9 Identified Resources and Action Alternatives**

Appendix 18B describes identified cultural resources affected by each of the four options alignments in Alternatives 1A through 1C and Alternative 9. These resources were identified through

record searches at the various regional offices of the CHRIS. The table also identifies which resources occur in each of the other 11 alternatives, and resources that are unique to specific alternatives. These resources were largely recorded during studies conducted for other projects that crossed portions of the current right-of-way for the various action alternatives. This set of identified resources provides a sample of the sensitivity of these rights-of-way for additional cultural resources, and indicates that all action alternatives are sensitive for archaeological and built environment resources. Appendix 18A provides a further analysis of the sensitivity of the Plan Area for buried archaeological resources based on land forms and geological processes.

## 18.2 Regulatory Setting

### 18.2.1 Federal Plans, Policies, and Regulations

#### 18.2.1.1 National Environmental Policy Act

NEPA establishes the federal policy of protecting important historic, cultural, and natural aspects of our national heritage during federal project planning. NEPA also obligates federal agencies to consider the environmental consequences and costs of their projects and programs as part of the planning process. All federal or federally assisted projects requiring action pursuant to Section 102 of the act must take into account the effects on cultural resources (42 United States Code [USC] 4321–4347).

The Council on Environmental Quality (CEQ) Guidelines provided a standard for determining the significance of effects analyzed under NEPA. *Significance* as used in NEPA requires considering effects in terms of both context and intensity (40 Code of Federal Regulations [CFR] 1508.27).

- *Context* means that the action must be analyzed in terms of society as a whole, the affected region and interests, and the local setting. The span of the context should be scaled to match the action. For larger actions a wider context is appropriate. For smaller site-specific actions the local context may be sufficient. Both the short- and long-term effects of an action are relevant to this analysis (40 CFR 1508.27[a]).
- *Intensity* means the severity of an impact. The CEQ Guidelines direct federal agencies to consider cultural resources when evaluating intensity. Specific factors that may affect the intensity of an impact include the proximity to historical or cultural resources, the potential for effects on NRHP-eligible or listed properties and the potential for loss or destruction of significant scientific, cultural, or historical resources (40 CFR 1508.27[b]).

Collectively, these considerations mean that NEPA analysis should identify the potential for an action to adversely affect resources that are or may be eligible for listing on the NRHP.

#### 18.2.1.2 Section 106 of the National Historic Preservation Act of 1966

Section 106 of the NHPA requires federal agencies to consider the effects of their actions on historic properties (16 USC 470f). *Historic properties* are resources listed on or eligible for listing on the NRHP (36 CFR Part 800.16[l][1]). A property may be listed in the NRHP if it meets criteria provided in the NRHP regulations (36 CFR 60.4):

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- The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:
  - (A) That are associated with events that have made a significant contribution to the broad patterns of our history; or
  - (B) That are associated with the lives of persons significant in our past; or
  - (C) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess artistic value, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
  - (D) That have yielded, or may be likely to yield, information important in prehistory or history.

The Section 106 review process typically consists of the following major steps.

- Initiate Section 106 process.
- Identify historic properties.
- Assess adverse effects.
- Resolve adverse effects.
- Implement project.

The Section 106 regulations define an adverse effect as an effect that alters, directly or indirectly, the qualities that make a resource eligible for listing in the NRHP (36 CFR 800.5[a][1]). Consideration must be given to the property's location, design, setting, materials, workmanship, feeling, and association, to the extent that these qualities contribute to the integrity and significance of the resource. Adverse effects may be direct and reasonably foreseeable, or may be more remote in time or distance (36 CFR Part 8010.5[a][1]). Examples of adverse effects are listed below.

- Physical destruction of or damage to all or part of the property.
- Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties and applicable guidelines.
- Removal of the property from its historic location.
- Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance.
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features.
- Neglect of a property that causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization.
- Transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

### **18.2.1.3 Section 106 Compliance for the BDCP**

The lead agency for Section 106 compliance for the BDCP has not yet been identified. Section 106 review will be performed for relevant federal actions that qualify as undertakings and that are necessary to implement the BDCP.

### **18.2.1.4 Native American Graves Protection and Repatriation Act**

The Native American Graves Protection and Repatriation Act (NAGPRA) defines the ownership of Native American human remains and funerary materials excavated on lands owned or controlled by the federal government. NAGPRA establishes a hierarchy of ownership as follows (25 USC 3002[a]).

- Where the lineal descendants can be found, the lineal descendants own the remains.
- Where the lineal descendants cannot be found, the remains belong to the Indian tribe or Native Hawaiian organization on whose land the remains were found.
- If the remains are discovered on other lands owned or controlled by the federal government and the lineal descendants cannot be determined, the remains belong to the Indian tribe or Native Hawaiian organization that is culturally affiliated with the remains, or the tribe that aboriginally occupied the land where the remains were discovered.

Under NAGPRA intentional excavation of Native American human remains on lands owned or controlled by the federal government may occur (25 USC 3002[c]) only under the following circumstances.

- With a permit issued under the Archaeological Resources Protection Act (16 USC 470cc).
- After documented consultation with the relevant tribal or Native American groups.

NAGPRA also provides guidance on inadvertent discoveries of Native American or Hawaiian human remains on lands owned or controlled by the federal government. When an inadvertent discovery on these lands occurs in association with construction, construction must cease. The party that discovers the remains must notify the relevant federal agency, and the remains must be transferred according to the ownership provisions above (25 USC 3002[d]).

### **18.2.1.5 The Archaeological Resources Protection Act**

The Archaeological Resources Protection Act (ARPA) requires a permit for intentional excavation of archaeological materials on federal lands (16 USC 470ee[a]). The federal agency that owns or controls the land may dispense permits for excavation as provided in the ARPA regulations (43 CFR Section 7.5). The permit may require notice to affected Indian tribes (43 CFR Section 7.7), and compliance with the terms and conditions provided in the ARPA regulations (43 CFR Section 7.9).

## **18.2.2 State Plans, Policies, and Regulations**

### **18.2.2.1 California Environmental Quality Act – Statute and Guidelines**

CEQA requires the lead agency to consider the effects of a project on cultural resources. Two categories of cultural resources are specifically called out in the State CEQA Guidelines; historical resources (State CEQA Guidelines Section 15064.5[b]) and unique archaeological sites (State CEQA Guidelines 15064.5[c] and California Public Resources Code (PRC) Section 21083.2). Different legal

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rules apply to the two different categories of cultural resources, though the two categories sometimes overlap where a “unique archaeological resource” also qualifies as an “historical resource.” In such an instance, the more stringent rules for archaeological resources that are historical resources apply, as explained below. CEQA and other California laws also set forth special rules for dealing with human remains that might be encountered during construction.

Historical resources are those meeting the requirements listed below.

- Resources listed in or determined eligible for listing in the CRHR (State CEQA Guidelines Section 15064.5[a][1]).
- Resources included in a local register as defined in California PRC Section 5020.1(k), “unless the preponderance of evidence demonstrates” that the resource “is not historically or culturally significant.” (State CEQA Guidelines Section 15064.5[a][2]).
- Resources that are identified as significant in surveys that meet the standards provided in California PRC Section 5024.1[g] (State CEQA Guidelines Section 15064.5[a][3]).
- Resources that the lead agency determines are significant, based on substantial evidence (State CEQA Guidelines Section 15064.5[a][3]).

Cultural resources may be listed in the CRHR if they have significance and integrity. Cultural resources are significant if they meet any of the following criteria:

- Are associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage, or the United States (California Code of Regulations [CCR], Title 14, Section 4852[b][1]),
- Are associated with the lives of persons important in our past (14 CCR 4852[b][2]),
- Embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual, or possess high artistic values (14 CCR 4852[b][3]), or;
- Yield, or may be likely to yield, information important in prehistory or history (14 CCR 4852[b][4]).

Integrity for built-environment resources means the “survival of characteristics that existed during the resource’s period of significance. Integrity must also be assessed in relationship to the particular criterion under which a resource has significance. For example, even where a resource has “lost its historic character or appearance [it] may still have sufficient integrity for the California Register if it maintains the potential to yield significant scientific or historical information or specific data.” Integrity is further defined as the ability to “convey the reasons” for the significance of the resource. (14 CCR 4852[c])

For archaeological sites, this language therefore means that a site must have a likelihood of yielding useful information for research in order to have integrity, if the site is significant for its data potential.

The fact that a resource is not listed in, or determined to be eligible for listing in the California Register of Historic Resources, not included in a local register of historical resources, or identified in an historical resource survey does not preclude a lead agency under CEQA from determining that the resource *may* be an historical resource as defined in California PRC Section 5020.1(j) or 5024.1 (State CEQA Guidelines Section 15064.5[a][4]).



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Notably, a project that causes a substantial adverse change in the significance of an historical resource is a project that may have significant impact under CEQA (State CEQA Guidelines Section 15064.5[b]). A substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired. The significance of an historical resource is materially impaired if the project demolishes or materially alters any qualities as follows.

- That justify the inclusion or eligibility for inclusion of a resource on the CRHR (State CEQA Guidelines Section 15064.5[b][2][A],[C]).
- That justify the inclusion of the resource on a local register (State CEQA Guidelines Section 15064.5[b][2][B]).

*Unique archaeological resources*, on the other hand, are defined in California PRC Section 21083.2 as a resource that meets at least one of the following criteria.

- Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information.
- Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- Is directly associated with a scientifically recognized important prehistoric or historic event or person. (California PRC Section 21083.2[g])\

### **Integrity Considerations For Historic-Era Built Environment Resources**

Integrity in this context is the authenticity of a historic resource's physical characteristics so that it is recognizable as a historic resource and retains its ability to convey its historical associations or attributes. The evaluation of integrity is grounded in the evaluator's understanding of a property's physical features and how these features relate to its historical associations or attributes. Associations and attributes for properties found in the Delta have been summarized in Section 18.1.6 Historic-Era Setting and Section 18.1.7, Historic-Era Property Types from the historic context and discussion of relevant property types included in the technical report [*pending, will be included as an appendix*].

Both the CRHR and NRHP define the following seven aspects of integrity:

- **Location:** where the historic property was constructed or the place where the historic event occurred.
- **Design:** the combination of elements that create the historic form, plan, space, structure, and style of a property. This includes organization of space, proportion, scale, technology, ornamentation, and materials. This is applicable to larger properties for the historic way in which the buildings, sites, and structures are related.
- **Setting:** the physical environment of a historic property. It refers to the historic character of the property. It includes the historical relationship of the property to surrounding features and open space. These include topographic features, vegetation, simple manmade paths or fencing and the relationships between buildings, structures or open space.
- **Materials:** the physical elements that were combined during a particular period of time and in a particular pattern or configuration to form the historic property.

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- **Workmanship:** the physical evidence of the crafts of a particular culture or people during a given period in history. It may be expressed in vernacular methods of construction and plain finishes or in highly sophisticated configuration and ornamental detailing.
- **Feeling:** the property's expression of the aesthetic or historic sense of a particular period of time. It results from the presence of physical features that, taken together, convey the property's historic character.
- **Association:** the direct link between an important historic event or person and a historic property. A property retains association if it is the place where the event or activity occurred and is sufficiently intact to convey that relationship to an observer. Like feeling, association requires the presence of physical features that convey a property's historic character.

The Delta contains a large variety of built resources, from levees to communities, spanning a period from about 1850 to present. When considering integrity, properties that are rare or are early examples of built resources in the region are held to lower standards of integrity because such resources are proportionally more important than abundant or more recent resources. Delta-style houses, some of the earliest residential building in the region, are one such property type because they are particular to the region, having been designed in response to that environment and, due to their age and modest origins, are more likely to have been subject to incongruous alterations over the years or poorly maintained than the grander late 19<sup>th</sup> century - 1920s farming estates or river-front homes.

Integrity conclusions for large agricultural properties are complex in that these properties have multiple associated features to consider and were likely developed over time in response to technological advances, changes in land use, and changes in number of residents. When determining integrity for this kind of property, the architectural historian looked at the property as a whole and determined which resources would be contributors to the property and which would be of primary importance to the property's significance. For example, an agricultural property may have altered residences, new outbuildings, an altered barn, and a shed that appears to be original or not altered in the last 45 years. Based on the ubiquitous nature of sheds in rural landscapes, it is unlikely that the shed would be individually eligible. Due to the property's majority of altered and newly built resources, it will have been determined to lack integrity. If insufficient primary buildings, such as the main residence or major agriculture-related buildings such as barns were not visible from the public right-of-way, the property as a whole was listed as being insufficiently accessible and no determination could be made.

Properties such as the islands/reclamation districts or railroads that are subject to heavy use or gradual impacts from environmental stresses have to be maintained to continue to be useable. Some materials and structures on the islands may have to be replaced, such as pumps and pipes, or reinforced, such as the levees, Railroad ties rot and have to be replaced. The historic use of the island is maintained and the alignment and grade of the railroad is unaltered, which are the over-arching historic features of these kinds of properties. Accordingly, ongoing repair and replacement of individual components of the resource may be consistent with the character and significance of the resource. These factors are considered when determining levels of integrity.

If a property known to be 45 years old or more appears to have been significantly altered within the last 45 years, such that it no longer retains character-defining elements, and so that it is recognizable as a historic resource, and no longer retains its ability to convey its historical associations or attributes, it is considered to not have adequate historic integrity.

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While integrity can be somewhat subjective, the following are alterations commonly seen in Delta buildings:

- Windows have been replaced with inconsistent window types, such as aluminum or vinyl;
- Window openings have been changed, enclosed, or new opening have been made;
- Siding has been replaced with a substitute material, such as vinyl, aluminum, stucco;
- Rooflines have been changed;
- Doors have been replaced with new doors inconsistent with the original in style and/or material;
- Door openings have been altered, enlarged, or moved;
- Ornamentation characteristic to specific architectural styles has been added or removed;
- Additions, particularly those out of scale or otherwise inconsistent in materials, form or massing.

These considerations were taken into account when conducting field surveys and when assessing effects.

### **Mitigation Requirements for Archaeological Resources Qualifying As Historical Resources**

As set forth in State CEQA Guidelines Section 15064.5[c], special rules apply where a lead agency is not certain at first whether an archaeological resource qualifies as either an “historical resource” or a “unique archaeological resource.” That section provides that “[w]hen a project will impact an archaeological site, a lead agency shall first determine whether the site is an historical resource[.]” “If a lead agency determines that the archaeological site is an historical resource,” the resource shall be subject to the rules set forth above regarding historical resources. In addition, according to State CEQA Guidelines Section 15126.4[b]

[p]ublic agencies should, whenever feasible, seek to avoid damaging effects on any historical resource of an archaeological nature. The following factors shall be considered and discussed in an EIR for a project involving such an archaeological site:

- (A) Preservation in place is the preferred manner of mitigating impacts to archaeological sites. Preservation in place maintains the relationship between artifacts and the archaeological context. Preservation may also avoid conflict with religious or cultural values of groups associated with the site.
- (B) Preservation in place may be accomplished by, but is not limited to, the following:
  1. Planning construction to avoid archaeological sites;
  2. Incorporation of sites within parks, greenspace, or other open space;
  3. Covering the archaeological sites with a layer of chemically stable soil before building tennis courts, parking lots, or similar facilities on the site.
  4. Deeding the site into a permanent conservation easement.

Thus, although California PRC Section 21083.2, in dealing with “unique archaeological sites,” provides for specific mitigation options “in no order of preference,” CEQA Guidelines Section 15126.4[b], in dealing with “historical resources of an archaeological nature,” provides that “[p]reservation in place is the preferred manner of mitigating impacts to archaeological sites.”

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For archaeological resources that qualify as historical resources, “data recovery” is a disfavored form of mitigation compared with “preservation in place.” Yet “[w]hen data recovery through excavation is the only feasible mitigation, a data recovery plan, which makes provisions for adequately recovering the scientifically consequential information from and about the historical resource, shall be prepared and adopted prior to any excavation being undertaken. Such studies shall be deposited with the California Historical Resources Regional Information Center.” Moreover, “[i]f an artifact must be removed during project excavation or testing, curation may be an appropriate mitigation” (State CEQA Guidelines Section 15126.4[b][3][C]). “Data recovery shall not be required[, however,] for an historical resource [as with a unique archaeological resource] if the lead agency determines that testing or studies already completed have adequately recovered the scientifically consequential information from and about the archaeological or historical resource, provided that the determination is documented in the EIR and that the studies are deposited with the California Historical Resources Regional Information Center” (State CEQA Guidelines Section 15126.4[b][3][D]).

With respect to *both* historical resources and unique archaeological resources

a lead agency should make provisions for...resources accidentally discovered during construction. These provisions should include an immediate evaluation of the find by a qualified archaeologist. If the find is determined to be an historical or unique archaeological resource, contingency funding and a time allotment sufficient to allow for implementation of avoidance measures or appropriate mitigation should be available. Work could continue on other parts of the building site while historical or unique archaeological resource mitigation takes place. (State CEQA Guidelines Section 15064.5[f])

### Mitigation for Unique Archaeological Resources

If a lead agency determines that “an archaeological site does *not* meet the criteria” for qualifying as an historical resource “but does meet the definition of a unique archeological resource..., the site shall be treated in accordance with the provisions of section 21083.2” (described above). Section 21083.2 contains the special rules for mitigation for “unique archaeological resources.” These rules do not apply if the archaeological resource is an historical resource (State CEQA Guidelines Section 15064.5[c][1]). The CEQA Statute states that

[i]f it can be demonstrated that a project will cause damage to a unique archaeological resource, the lead agency may require reasonable efforts to be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. Examples of that treatment, in no order of preference, may include, but are not limited to, any of the following:

1. Planning construction to avoid archaeological sites.
2. Deeding archaeological sites into permanent conservation easements.
3. Capping or covering archaeological sites with a layer of soil before building on the sites.
4. Planning parks, greenspace, or other open space to incorporate archaeological sites.

Excavation as mitigation shall be restricted to those parts of the unique archaeological resource that would be damaged or destroyed by the project. Excavation as mitigation shall not be required for a unique archaeological resource if the lead agency determines that testing or studies already completed have adequately recovered the scientifically consequential information from and about the resource, if this determination is documented in the environmental impact report. (California Public Resources Code Section 21083.2[d])

If, however, “an archaeological resource is neither a unique archaeological nor an historical resource, the effects of the project on those resources shall not be considered a significant effect on the environment. It shall be sufficient that both the resource and the effect on it are noted in the Initial Study or EIR, if one is prepared to address impacts on other resources, but they need not be considered further in the CEQA process” (State CEQA Guidelines Section 15064.5[c][4]).

### 18.2.2.2 California PRC, Duties of State Agencies

California state agencies must provide the Office of Historic Preservation an inventory of all state-owned structures older than 50 years of age under its jurisdiction that are listed in or that may be eligible for inclusion in the NRHP or are registered or that may be eligible for registration as a state historical landmark (California PRC Section 5024[a]). The Office of Historic Preservation compiles these lists into a master list (California PRC Section 5024[d]).

State agencies must provide notice to the State Historic Preservation Officer early in the planning process if the agency intends to alter or demolish resources on the master list (California PRC Section 5024.5[a]). The State Historic Preservation Officer has 30 days to respond after receiving notice. If the State Historic Preservation Officer determines that the action will have an adverse effect on a listed historical resource, the agency must adopt prudent and feasible measures to mitigate or eliminate the adverse effects (California PRC Section 5024.5[b]).

### 18.2.2.3 Discoveries of Human Remains under California Environmental Quality Act Public Law

California law sets forth special rules that apply where *human remains* are encountered during project construction. These rules are set forth in one place in State CEQA Guidelines Section 15064.5[e] as follows:

In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps should be taken:

- (1) There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:
  - (A) The coroner of the county in which the remains are discovered must be contacted to determine that no investigation of the cause of death is required (as required under California Health and Safety Code Section 7050.5).
  - (B) If the coroner determines the remains to be Native American:
    1. The coroner shall contact the Native American Heritage Commission within 24 hours.
    2. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American.
    3. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods (as provided in Public Resources Code Section 5097.98), or
- (2) Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance.

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- (A) The Native American Heritage Commission is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission.
- (B) The descendant identified fails to make a recommendation; or
- (C) The landowner or his authorized representative rejects the recommendation of the descendant, and the mediation by the Native American Heritage Commission fails to provide measures acceptable to the landowner.

### 18.2.2.4 California Native American Graves Protection and Repatriation Act

Sections 8010–8011 of the California Health and Safety Code establish a state repatriation policy that is consistent with and facilitates implementation of NAGPRA. The policy requires that all California Indian human remains and cultural items be treated with dignity and respect and encourages voluntary disclosure and return of remains and cultural items by publicly funded agencies and museums in California. The policy provides for mechanisms to aid California Indian tribes, including non–federally recognized tribes, in filing repatriation claims and getting responses to those claims.

## 18.2.3 Regional and Local Plans, Policies, and Regulations

### 18.2.3.1 City and County General Plans

Many of the counties and cities encompassing lands in the Plan Area have developed policies and goals intended to document and preserve cultural resources in their areas. These general plans specify locally proposed goals or objectives and policies intended to enforce them. As described more fully in Chapter 13, *Land Use*, state agencies, such as DWR, are not bound by local general plans and policies.

### 18.2.3.2 Alameda County

#### East County Area Plan

Land use planning in the eastern portion of Alameda County is governed by the East County Area Plan (ECAP), which was adopted by the County in May 1994. In November 2000, the Alameda County electorate approved Measure D, the Save Agriculture and Open Space Lands Initiative, which amended portions of the general plan, including the ECAP (Alameda County 2000).

The Open Space Element addresses sensitive lands and regionally significant open space, including cultural resources. Goals and policies from the ECAP related to protection of cultural resources that apply to the Plan Area are listed below (Alameda County 2000).

- **Goal:** To protect cultural resources from development.
  - **Policy 136:** The County shall identify and preserve significant archaeological and historical resources, including structures and sites which contribute to the heritage of East County.
  - **Policy 137:** The County shall require development to be designed to avoid cultural resources or, if avoidance is determined by the County to be infeasible, to include appropriate mitigation measures that offset the impacts.

### 18.2.3.3 Contra Costa County

#### Contra Costa County General Plan

A comprehensive update to the Contra Costa County General Plan was adopted on January 18, 1991. Amendments to the general plan followed in 1996 and 2005 to reflect changes to the Land Use Map and the incorporation of the City of Oakley (Roche pers. comm.). The Open Space Element of the general plan addresses preservation of historical and cultural resources. The following goal and policy from the Open Space Element are considered applicable to implementation of the BDCP (Contra Costa County 2005).

- **Policy 9-31:** To identify and preserve important archaeological and historic resources within the County.
- **Policy 9-32:** Areas which have identifiable and important archaeological or historic significance shall be preserved for such uses, preferably in public ownership.

### 18.2.3.4 City of Lathrop

The Resource Management Element of the City of Lathrop General Plan (2004) identifies the following goals and policies encouraging protection of cultural resources for land development projects within the City's boundaries:

- **Policy 7.3:** Significant natural open space and cultural resources should be identified prior to development and incorporated into site-specific development project design.
  - Archaeological and Cultural Resource Policies:
    - (1) Existing known archaeological and cultural resources are to be protected, beginning with the filing of an application for development in the immediate vicinity of such resources. The City shall follow the procedures set forth in Appendix K of CEQA Guidelines. Confidentiality shall be maintained between the City and developer to avoid vandalism or desecration of such resources. Alternatives for development design intended to protect cultural resources shall be reviewed by a Native American having competence in understanding and interpreting the importance of the resources and of the most desirable methods to assure their preservation.
    - (2) The potential loss of as yet unknown archaeological and cultural resources shall be avoided by close monitoring of the development process. The close proximity of properties intended for development to natural watercourses or to known archaeological or cultural resources shall be taken as a signal by the City and developer of a potential for unearthing unknown resources. In such cases, the City shall instruct the developers, construction foremen and City inspectors of the potential for damage to artifacts and sites, and provide written instructions requiring a halt to all excavation work in the event of any find until the significance of the find can be evaluated by competent archaeological and Native American specialists. The costs of such protection work shall be the responsibility of the developer.

### 18.2.3.5 City of Oakley

#### City of Oakley General Plan

The City of Oakley General Plan was adopted on December 16, 2002. The Open Space and Conservation Element of the general plan addresses protection and enhancement of environmental resources, including cultural resources, in the Sacramento–San Joaquin River Delta (Delta). The following goal and policy from the Open Space and Conservation Element are considered applicable to implementation of the BDCP (City of Oakley 2002).

- **Goal 6.4:** Encourage preservation of cultural resources within the Plan Area.
  - **Policy 6.4.1:** Preserve areas that have identifiable and important archaeological or paleontological significance.

### 18.2.3.6 Sacramento County

#### Sacramento County General Plan

The Sacramento County General Plan Update was adopted on November 9, 2011. The amended Conservation Element addresses protection of cultural resources. The following objective and policies from the Conservation Element of the general plan are considered applicable to implementation of the BDCP (Sacramento County 2011).

- **Goal:** Promote the inventory, protection and interpretation of the cultural heritage of Sacramento County, including historical and archaeological settings, sites, buildings, features, artifacts and/or areas of ethnic historical, religious or socioeconomical importance.
  - **Objective:** Preserve structures such as buildings, bridges, or other permanent structures with architectural or historical importance to maintain contributing design.
    - **Policy CO-164:** Structures having historical and architectural importance shall be preserved and protected.
    - **Policy CO-165:** Refer projects involving structures or within districts having historical or architectural importance to the Cultural Resources Committee to recommend appropriate means of protection and mitigation.
    - **Policy CO-166:** Development surrounding areas of historic significance shall have compatible design in order to protect and enhance the historic quality of the areas.
    - **Policy CO-167:** When conducting planning studies, County Planning staff, shall encourage the adaptive reuse of historic resources when the original use is no longer feasible or allowed under proposed area planning efforts.
    - **Policy CO-168:** County-owned historic and cultural resources shall be preserved and maintained, such that modifications, alterations, and rehabilitations are conducted in a manner that is consistent with the U.S. Secretary of the Interiors Standards for the Treatment of Historic Properties.



### 18.2.3.7 City of Sacramento

#### City of Sacramento General Plan

The City of Sacramento 2030 General Plan was adopted on March 3, 2009. The revised Historic and Cultural Resources Element of the general plan addresses preservation of historical and cultural resources and adaptive reuse of historic structures. The following goal and policies from the Historic and Cultural Resources Element are considered applicable to implementation of the BDCP (City of Sacramento 2009).

- **Goal HCR 2.1, Identification and Preservation of Historic and Cultural Resources:** Identify and preserve the City's historic and cultural resources to enrich our sense of place and our understanding of the City's prehistory and history.
  - **HCR 2.1.2, Applicable Laws and Regulations:** The City shall ensure that City, State, and Federal historic preservation laws, regulations, and codes are implemented, including the California Historical Building Code and State laws related to archaeological resources, to ensure the adequate protection of these resources.
  - **HCR 2.1.3, Consultation:** The City shall consult with the appropriate organizations and individuals (e.g., Information Centers of the CHRIS System, the NAHC, and Native American groups and individuals) to minimize potential impacts to historic and cultural resources.
  - **HCR 2.1.15, Archaeological Resources:** The City shall develop or ensure compliance with protocols that protect or mitigate impacts to archaeological, historic, and cultural resources including prehistoric resources.

### 18.2.3.8 San Joaquin County

#### San Joaquin County General Plan

The San Joaquin County General Plan 2010 was adopted on July 29, 1992. The Resources Element contained in Volume 1 of the general plan addresses protection of heritage resources, including archaeological resources. The following objective and policies from the Resources Element are considered applicable to implementation of the BDCP (San Joaquin County 1992):

- **Objective 1:** To protect San Joaquin County's valuable architectural, historical, archaeological, and cultural resources.
  - **Policy 2:** Significant archaeological and historical resources shall be identified and protected from destruction. If evidence of such resources appears after development begins, an assessment shall be made of the appropriate actions to preserve or remove the resources.
  - **Policy 3:** No significant architectural, historical, archaeological or cultural resources shall be knowingly destroyed through County action.

### 18.2.3.9 Solano County

#### Solano County General Plan

The Solano County General Plan was adopted on August 5, 2008, and was subject to voter approval as Measure T on the November 4, 2008, ballot. Measure T was passed by the voters, thereby confirming the approval of the new general plan.

#### Cultural Resources

The Resources Chapter of the Solano County General Plan includes an Open Space Element that addresses preservation and protection of recreational, scenic, agricultural, and cultural resources. The following policy from the Open Space Element of the Resources Chapter is considered applicable to implementation of the BDCP (Solano County 2008).

- **Policy RS.P-38:** Identify and preserve important prehistoric and historic structures, features, and communities.

### 18.2.3.10 City of Stockton

#### City of Stockton General Plan

The City of Stockton General Plan includes a natural and cultural resources element with the following policies that addresses protection of cultural resources within the City (City of Stockton 2007):

- **NCR-3.5 Archaeological Resource Surveys:** Prior to project approval, the City shall require project applicant to have a qualified archeologist conduct the following activities: (1) conduct a record search at the Central California Information Center located at California State University Stanislaus and other appropriate historical repositories, (2) conduct field surveys where appropriate, and (3) prepare technical reports, where appropriate, meeting California Office of Historic Preservation Standards.
- **NCR-3.6 Discovery of Archaeological Resources:** Consistent with Stockton Municipal Code Section 16-310.050, *Cultural Resources*, in the event that archaeological/paleontological resources are discovered during site excavation, the City shall require that grading and construction work on the project site be suspended until the significance of the features can be determined by a qualified archaeologist/paleontologist. The City will require that a qualified archeologist/paleontologist make recommendations for measures necessary to protect any site determined to contain or constitute an historical resource, a unique archaeological resource, or a unique paleontological resource or to undertake data recovery, excavation, analysis, and curation of archaeological/paleontologist materials. City staff shall consider such recommendations and implement them where they are feasible in light of project design as previously approved by the City.
- **NCR-3.8 Discovery of Human Remains:** Consistent with Stockton Municipal Code Section 16-310.050, If any human remains are discovered or recognized in any location on the project site, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until the county coroner is notified, and if the remains are of prehistoric Native American origin, the NAHC is notified and the requirements of California PRC Section 5097.98 are met.

### 18.2.3.1 City of Rio Vista

#### City of Rio Vista General Plan

The City of Rio Vista General Plan 2001 was adopted on July 18, 2002. The Resource Conservation and Management Element of the general plan addresses conservation of resources, including historical resources. The following goal and policy from the general plan are considered applicable to implementation of the BDCP (City of Rio Vista 2002).

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- **Goal 10.10:** To encourage preservation of the City's historic resources while enhancing their value and economic life.
  - **Policy 10.10.C:** The City shall require that discretionary development projects identify important historic, archaeological, and cultural sites and their contributing environment from damage, destruction, and abuse. The City shall ensure that such assessments are incorporated into the City's cultural and historical database, to be maintained by the Rio Vista Museum.

### 18.2.3.2 Yolo County

#### Yolo County General Plan

The Yolo County General Plan was adopted on November 10, 2009. The general plan integrates, by reference, locally effective parts of the Delta Protection Commission's Land Use and Resource Management Plan for the Primary Zone of the Delta.

The Conservation and Open Space Element of the Yolo County General Plan addresses preservation of various resources in an open space environment. The following policies from the general plan are considered applicable to implementation of the BDCP (Yolo County 2009).

- **Goal CO-4, Cultural Resources:** Preserve and protect cultural resources within the County.
  - **Policy CO-4.1:** Identify and safeguard important cultural resources.
  - **Policy CO-4.12:** Work with culturally affiliated tribes to identify and appropriately address cultural resources and tribal sacred sites through the development review process.
  - **Policy CO-4.13:** Avoid or mitigate to the maximum extent feasible the impacts of development on Native American archaeological and cultural resources.
  - **Policy CO-4.14:** Within the Delta Primary Zone, ensure compatibility of permitted land use activities with applicable cultural resources policies of the Land Use and Resource Management Plan of the Delta Protection Commission.

## 18.3 Environmental Consequences

This section describes the methods used to identify the known resources that would be affected by the action alternatives as well as BDCP effects on previously unidentified resources. The direct, indirect, and cumulative effects on known and unknown archeological, built environment, and TCP resources that would result from implementing BDCP alternatives are evaluated and mitigation measures are presented to reduce potential effects.

### 18.3.1 Determination of Adverse Effects

This section describes the criteria used to identify adverse effects on cultural resources. "Adverse effect" here means effects that are significant under the relevant regulatory frameworks and thresholds, and includes, but is not limited to, effects that are "adverse" within the meaning of the Section 106 regulations.

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Effects on cultural resources are considered adverse for purposes of NEPA, and significant for purposes of CEQA, if the BDCP would do any of the following.

- Demolish or materially alter the qualities that justify the resource for inclusion or eligibility for inclusion on the CRHR (State CEQA Guidelines Section 15064.5[b][2][A],[C]). For the purposes of this analysis, materially altering or destroying qualities that contribute to eligibility means altering the resource so that it can no longer convey its association with significant historical events or people, distinctive style or artistic value, or the potential to yield information important in history or prehistory (14 Cal. Code of Regulations Section 4852[b]).
- Demolish or materially alter the qualities that justify the inclusion of the resource on a local register (State CEQA Guidelines Section 15064.5[b][2][B]) or its identification as an historical resource survey meeting the requirements of California PRC Section 5024.1(g). For the purposes of this analysis, materially altering a resource so that it no longer qualifies for a local register means altering the resource so it can no longer convey the significance that makes it eligible for the local register. These significance themes often mirror the CRHR and the NRHP, but emphasis historical or cultural themes that are locally relevant.
- Demolish or materially impair the characteristics that allow a site to qualify as a unique archaeological resource (California PRC Section 21083.2[g]). Demolishing or materially impairing a unique archaeological resource means altering the ability of the site to convey one or more of the following characteristics:
  - data useful in important scientific questions associated with demonstrable public interest in those questions;
  - the quality of being the oldest or best example of a type;
  - or association with an important person or event in history or prehistory (California Public Resources Code Section 2183.2[g]).
- Alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association (36 CFR 800.5[a][1]). For the purposes of this analysis, alteration of qualifying characteristics may include but is not necessarily limited to:
  - physical destruction of all or part of a property;
  - alteration of built environment resources that is not consistent with the federal standards for treatment of historic properties (36 CFR Part 68);
  - removal of a property from its historical location;
  - alteration of the significant features of a property or introduction of incongruous elements to the setting;
  - for federally owned properties, transfer of the property out of federal control without adequate and legally enforceable mechanisms to ensure preservation; and,
  - neglect of a property that results in deterioration (36 CFR Part 800.5[a][2]).
- Disturbance of human remains, including remains interred outside of established cemeteries is an adverse effect (State CEQA Guidelines, Appendix G checklist). For the purposes of this

analysis disturbance may consist of direct excavation or damage through compaction even where the resource is not directly excavated.

### **18.3.2 Direct and Indirect Effects and Impact Mechanisms**

BDCP-related activities may affect cultural resources directly or indirectly. This section describes the direct and indirect impact mechanisms associated with the BDCP alternatives. Direct effects on cultural resources may occur through any of the following.

- Ground-disturbing construction that damages historic or prehistoric archaeological sites and impairs the constituent deposits in the site and their utility for answering archaeological research questions.
- Ground-disturbing construction that unearths and damages human remains.
- Direct demolition of built environment resources such as historic-era residences, structures or buildings, or landscape features.
- Direct excavation or alteration of traditional cultural properties.
- Direct effects on individual resources creating adverse effects on rural historic landscapes, where the individual resource is a constituent element of the rural historic landscape.

Indirect effects may occur under any of the circumstances described below.

- Construction in the vicinity of a resource removes features of the surrounding setting, where the setting is an integral part of the resource.
- Construction in the vicinity introduces new physical features that are incongruent with the setting, where the setting is an integral part of the resource.
- Introduction of new sources of sound or activities in the vicinity that would be inconsistent with the setting, where the setting is an integral part of the resource.

The BDCP alternatives would result in direct and indirect effects, as described below. Where resources have been recorded in the footprint of action alternatives, these resources are identified in the relevant impact discussions.

### **18.3.3 Geographic Scope of Effects**

The BDCP covers a large, generally rural area. The boundaries of the area in which significant effects could occur for each alternative were determined by taking this kind of environment into consideration, as well as the nature of the project, such as temporary impacts, temporary and permanent power access, and indirect or visual impacts. The approach was as follows:

- For direct impacts: all land physically within the footprint of alternative water conveyance alignments is included, for both temporary impacts and permanent impacts. Usually the entire legal parcel is included, whether or not it is all within the area of direct impacts. In areas where the parcels are very large, generally agricultural, the boundary of the survey map may not include the entire parcel, but includes a reasonable portion, determined by land use. The edge of the survey may be established following features such as roads, irrigation channels, changes in crops, or natural topographic features.

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- For the tunnel areas: all land directly above the tunnel was included, again generally including the entire legal parcel. It was decided that it would be prudent in some areas to include properties adjacent to the tunnel footprint if they contain built resources in close proximity to the tunnel footprint to demonstrate that effects potentially resulting from settlement or vibration are considered.
- For temporary and permanent power: only the footprint of the power line is included in the survey map. In cases where a built resource is very close to this footprint, that resource is included in the survey.
- For visual or auditory impacts: built resources facing on-bank intake facilities or pumping plants, but are across the river, are included. Resources adjacent to these plants are also included for these potential indirect effects.
- For impacts to National Register listed districts or potential districts: the district in its entirety is included, because an effect to one element of the district has the potential to diminish the integrity of the entire district.

### 18.3.4 Issues Not Carried Forward for Detailed Analysis

Potential effects on cultural resources at upstream reservoirs associated with operational changes are not carried forward for detailed analysis because they are too speculative for meaningful consideration. Currently, reservoir levels upstream of the Delta fluctuate greatly between wet and dry years, and during operational changes necessary to meet flood management and water use demands. Each action alternative is associated with particular operational changes for upstream reservoirs, or “scenarios” (see Chapter 3, *Description of Alternatives*). These operational changes, combined with other regional effects such as climate change, may (but are not certain to) increase both the range of variation in water levels at these reservoirs and the frequency that reservoir levels are drawn down. Current modeling shows that precipitation, rather than operational rules, is the largest cause of fluctuation at upstream reservoirs. Because precipitation patterns may be altered by climate change, a slight increase in the frequency with which cultural resources at upstream reservoirs are exposed rather than inundated may occur. However, because the increase in degree and frequency fluctuation is likely to be small and is speculative as to degree and intensity, this effect cannot be carried forward for meaningful analysis. Furthermore, climate change, by itself, is not an effect of the action alternatives.

### 18.3.5 Effects and Mitigation Approaches

#### 18.3.5.1 No Action Alternative

Under the No Action Alternative, current and reasonably foreseeable projects would continue, with the associated potential for effects on cultural resources. These projects and programs include the continued implementation of SWP/CVP operations, maintenance, enforcement, and protection programs by federal, state, and local agencies and nonprofit groups, as well as projects that are permitted or under construction. A complete list of the programs and plans considered under the No Action Alternative is provided in Appendix 3D.

#### The Future of Cultural Resources in the Delta

The Delta region is rich in prehistoric and historic-era cultural resources. These resources include prehistoric and historic archaeological sites, buried human remains, and built environment resources. Subsidence, levee failure, and climate change all have the potential to increase the inundation and erosion of cultural resources that currently occur on the landside of existing flood management structures. Such resources include prehistoric archaeological deposits, historic-era archaeological features, and built environment resources.

## **SWP/CVP Operations**

Ongoing SWP/CVP operations include both levee repair and habitat restoration and conservation activities. Where specific projects will result in ground-disturbing construction these actions have the potential to result in effects on cultural resources through direct excavation into such resources or the introduction of new inconsistent features such as setback levees, borrow areas, or other landside features that may not be consistent with the rural agricultural setting.

## **Ongoing Plans, Policies, and Programs**

A sample of the plans, policies, and projects that are included in the No Action Alternative are summarized in Table 18-1.

The plans, programs, and projects that would occur under the No Action Alternative collectively will result in adverse effects on cultural resources. For example, Yolo County concludes in the General Plan Update EIR that plan buildout will result in significant and unavoidable effects on cultural resources (Yolo County 2009:546). Similarly, levee repairs performed in the Delta region under the No Action conditions are likely to contribute to effects on archaeological and built environment resources and buried human remains because the Delta is sensitive for such resources, and construction of such improvements would require ground-disturbing work.

Although mitigation may be implemented that would reduce these effects, or manage significant effects through treatment, such treatment typically does not reduce impacts on cultural resources to less than adverse. Mitigation such as data recovery excavations conducted to retrieve scientifically important material from archaeological sites reduces the loss of data, but does not completely avoid data loss because complete recovery of data is typically infeasible. In addition, treatment of identified effects and construction monitoring cannot guarantee that effects on undiscovered archaeological resources and buried human remains would be avoided, because unidentified resources can occur without surface manifestation that would allow their identification and avoidance. In a similar fashion the set of actions that would occur under the No Action Alternative would likely result in the demolition of significant historical structures. Although mitigation is typically performed to document such structures before they are lost, such documentation does not replace the structure and does not reduce such impacts to a level less than significant. For these reasons, the loss of built environment cultural resources under the No Action Alternative would be adverse. No mitigation is proposed under this impact because the BDCP would not be implemented and no mitigation would be prepared for the action alternatives. Collectively, effects on cultural resources under the No Action Alternative would therefore be adverse.

**CEQA Conclusion:** Under the No Action conditions significant effects on archaeological and built environment resources as well as human remains would occur. Although it is expected that project-level review for individual actions would result in mitigation of these impacts, such mitigation would reduce but not avoid such effects. Data recovery excavations and construction phase monitoring do

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not avoid the loss of data in archaeological sites or the potential for inadvertent damage to buried resources and human remains that cannot be identified in advance of construction. Similarly, treatment for built environment resources would reduce the severity of effects, but would not mitigate the anticipated loss of significant structures to a level less than significant. For these reasons effects on cultural resources would be significant and unavoidable.

**Table 18-1. Programs and Projects Occurring under the No Action Alternative**

Agency	Program/Project	Status	Description of Program/Project	Potential Effects on Cultural Resources
California Department of Water Resources	Levee Repair-Levee Evaluation Program	Ongoing	Identification and repair of hundreds of levees throughout the Central Valley. These repairs are necessary to maintain the functionality of flood management systems that have deteriorated over time and/or do not meet current design standards.	Individual future levee repair projects may disturb landside and waterside cultural resources such as prehistoric and historic archaeological sites, and result in direct and indirect effects on built environment resources.
U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, National Marine Fisheries Service, California Department of Water Resources and California Department of Fish and Game	San Joaquin River Restoration Program	Ongoing	The program would implement a comprehensive long-term effort to restore flows to the San Joaquin River from Friant Dam to the confluence of Merced River and restore a self-sustaining Chinook salmon fishery in the river. There are many physical improvements within and near the San Joaquin River that will be undertaken to fully achieve the river restoration goal.	Individual projects necessary to implement this program may result in disturbance to cultural resources such as prehistoric and historic archaeological sites, and result in direct and indirect effects on built environment resources.
California Department of Water Resources	Delta Levees Flood Protection Program	Ongoing	Under this program DWR works with the local agencies to maintain, plan, and complete levee rehabilitation projects.	Individual projects necessary to implement this program may result in disturbance to cultural resources such as prehistoric and historic archaeological sites, and result in direct and indirect effects on built environment resources.



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Yolo County	Yolo County General Plan Update/Plan Buildout	Ongoing	The Yolo County 2030 General Plan was adopted in November of 2009. The updated plan would allow for additional growth in the unincorporated area of the County of approximately 30,195 people, up to 10,784 homes, and 19,209 jobs.	Buildout will result in significant effects on archaeological and built environment resources.
Delta Wetlands Project	Semitropic Water Storage District	Planned	Wildlife enhancement on Delta islands.	The project may demolish cultural resources or expedite decay of cultural resources.

### 18.3.5.2 Alternative 1A—Dual Conveyance with Pipeline/Tunnel and Intakes 1–5 (15,000 cfs; Operational Scenario A)

#### Impact CUL-1: Effects on identified archaeological sites resulting from construction of conveyance facilities

##### Identified Resources

Record searches at the CHRIS and inventory efforts have identified previously recorded prehistoric archaeological sites in the footprint of this alternative: CA-Sac-56, CA-Sac-57, CA-Sac-59, CA-Sac-65/H, and CA-Sac-328. Record searches also identified one historic archaeological site, CA-SJO-220H, in the footprint of this alternative. Detailed site descriptions summarizing available information regarding these resources, are provided in Appendix 18B. Because the tunnel alignment would be constructed more than 100 feet (30 meters) below the current land surface the resources above the tunnel would not be directly disturbed (no archaeological deposit has been identified in the Delta region that extends from the surface to this depth). Identified resources occurring above the tunnel alignment are not analyzed further because they would not be affected. Collectively, these six previously recorded resources represent the known resources that occur in the footprint of this alternative.

##### Significance of Identified Prehistoric and Historic Resources

Many of the directly affected sites are midden sites, with debris and artifacts associated with prehistoric habitation and residence activities. Midden sites in the Plan Area are often colloquially referred to as “mound sites” because they often form low mounds elevated relative to the surrounding landform. While the original raised deposit has sometimes been destroyed, midden sites often have substantial deposits below the original raised landform that remain intact that typically contain the material remains associated with prehistoric habitation. This organic debris can be used for radiocarbon dating, as well as material that reveals the nature of subsistence activities pursued by prehistoric populations. Because there is no single unified prehistoric chronology for the Delta region, substantial research questions remain unresolved regarding nature and changes of subsistence and settlement activity over the span of the prehistoric occupation of the Delta. The Delta is the prehistoric point of articulation between Central Valley cultures and the aboriginal people that occupied the San Francisco Bay area. Because the cultural chronology and sources of cultural change for the Delta remain unresolved in part, sites in the footprint of this

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alternative likely contain information that could help clarify these research issues. For this reason these resources are likely significant under the fourth criterion for the CRHR and NRHP.

Two of the identified sites contain human burials, as described on the site records (CA-Sac-328 and CA-Sac-56). Most if not all of the remaining sites are likely to contain additional burials because midden sites in the Plan Area typically contain human burials or cremations. Burial components within these sites often contain ornaments and other personal items such as charmstones, beads, and other decorative material. Because the style and form of these artifacts change throughout prehistory, and because these stylistic changes have been defined, these materials provide a method of associating archaeological material with specific prehistoric time periods. The ability to associate habitation remains with specific time periods is one of the most significant problems in prehistoric research, because the sequence of specific adaptations and behaviors only becomes clear when a chronology can be constructed that associates behavior and material culture with specific time frames. For this reason these resources are likely significant under the fourth criterion for the CRHR and NRHP.

The single historic-era archaeological resource, CA-SJo-220H, consists of a trash scatter and set of standing structures associated with George Shima and his agricultural work camps. Because this site is associated with an important economic theme of the reclamation and agricultural development of the delta, it may contain data useful in historic research. Available information such as the site record suggests that the resource is largely undisturbed and is likely to contain sufficient integrity to convey this significance. For these reasons it likely qualifies as an historical resource under CEQA and a historic property under the NRHP.

Because many of these resources are expansive (each in excess of 30 meters across), they are each likely to contain some portion of the deposit with sufficient integrity to yield artifacts in their original associations in a manner that will convey these significance themes. Therefore these identified resources are likely to qualify as historical resources under CEQA. For the same reasons, these resources are likely to qualify as historic properties under the NRHP.

#### **Anticipated Effects on Identified Resources**

The exact location of these resources cannot be disclosed because such disclosure might allow looters to find the sites on the ground and remove archaeological material. However, these resources occur within the footprint of both temporary work areas and permanent surface impacts. The resources are distributed evenly across the alignment, but are somewhat clustered where construction of large above-ground features would occur, such as the northern end of the alignment, at the intermediate forebay, and at the southern end of the alignment. Ground-disturbing construction is likely to disturb the deposits and thus materially their ability to convey their significance. Much of the data potential in archaeological resources exists in the spatial associations of different artifacts and other cultural material. Where artifacts that have known associations with particular time periods occur adjacent to other material such as faunal bone or plant remains from subsistence activity, the proximity of the materials allows an inference as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence strategies during different prehistoric periods. Intrusive ground-disturbing construction may disrupt these associations and thus disrupt the qualities for which the sites qualify as historical resources. For these reasons, construction has the potential to materially impair these resources under CEQA and to adversely affect the resources as defined by Section 106 of the NHPA. This effect would be adverse.

**CEQA Conclusion:** Construction of conveyance facilities would affect identified archaeological resources that occur in the footprint of this alternative. DWR has evaluated these resources and finds they are likely to qualify as historical resources under CEQA, as described in detail in Appendix 18B. This impact would be significant because construction could materially alter or destroy the potential of these resources to yield information useful in archaeological research, the basis for the significance of these resources, through excavation and disruption of the spatial associations that contain meaningful information. Mitigation Measure CUL-1a would reduce this impact, but would not guarantee that all of the scientifically important material would be retrieved because feasible archaeological excavation only typically retrieves a sample of the deposit, and portions of the site may remain after treatment with important information. Construction could damage these remaining portions of the deposit. Therefore, this impact is significant and unavoidable.

**Mitigation Measure CUL-1: Prepare a data recovery plan and perform data recovery excavations on the affected portion of the deposits of identified and significant archaeological sites**

Prior to ground-disturbing construction, the BDCP proponents will implement treatment for identified archaeological sites affected by Alternative 1A construction..

***Basis for Selection of Treatment***

Identified archaeological resources occur in the footprint of large, expansive features that would be constructed under this alternative. Because they occur within the footprint of these features, avoidance is not possible. Accordingly, data recovery is proposed to retrieve the scientifically important material that remains in these deposits. This data recovery excavation will conform to the following standards:

- The BDCP proponents will retain a qualified archaeological consultant to conduct data recovery excavations only within the portion of the deposit that would be directly affected. The remaining deposit outside of the area where ground disturbing construction would occur will remain undisturbed and will be preserved in place.
- DWR and Reclamation will prepare, and deposit with the North Central Information Center, a data recovery plan prior to conducting these excavations, as required under State CEQA Guidelines Section 15126.4(b)(3)(C). The plan will provide a literature review of recent regional archaeological research and a summary of regional research questions. The plan will incorporate the methods prescribed above and include a more detailed description of the sampling and excavation methods that are appropriate for the regional research questions. This plan will be prepared prior to the completion of the final EIR for the BDCP. The plan will not disclose the location of the resources subject to treatment in a manner that would allow their location and looting. The plan will be made publicly available either on the internet or as a hard copy available for public inspection, or both, prior to the certification of the EIR.
- Data recovery excavations will remove a sample of the affected portion of the deposit to retrieve scientifically important material. Excavation will be conducted in arbitrary levels, and material removed will be divided and screened through a combination of ¼" and 1/8" mesh screen, so as to capture both the gross cultural constituents and the finer material that can only be captured in fine mesh. Excavation will be conducted in 10-centimeter levels so that the horizontal association of different cultural materials is recorded. Removed material

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- will be segregated by type and bagged with labels noting their horizontal and vertical location relative to an established datum point. The datum point will be recorded in the field with GPS to at least 10-centimeter horizontal and vertical accuracy. If, in the course of data recovery excavations, it is determined that, contrary to available evidence, the resource lacks integrity, data recovery excavations will cease.
- Faunal material (animal bone) will be segregated and studied by a qualified faunal analyst to identify the species pursued, relative abundance and diversity of different species present, and the manner in which the prey were processed by the prehistoric occupants.
  - Obsidian glass will be retrieved and studied through both X-ray fluorescence (a method that allows the source of the obsidian to be identified) and obsidian hydration analysis (a method that allows approximate determination of the time when the material was subject to human modification).
  - Soil samples will be retrieved, with their horizontal and vertical location recorded, for flotation analysis (a method of separating light organic material such as fine plant remains from the deposit, in order to identify plant species pursued by prehistoric populations).
  - Because some of the resources subject to treatment contain human remains, provisions for such remains are necessary. If human remains are discovered in these deposits during data recovery, the county coroner will be contacted as required in California Health and Safety Code Section 7050.5. After the coroner confirms the remains are of prehistoric origin, the NAHC will be contacted and given the opportunity to identify a most likely descendant (MLD). The MLD will be given the opportunity to reinter the remains with appropriate dignity. If the NAHC fails to identify the MLD or if the parties cannot reach agreement as to how to reinter the remains as described in California PRC Section 5097.98(e), the landowner will reinter the remains at a location not subject to further disturbance. DWR will ensure the protections prescribed in California PRC Section 5097.98(e), are performed, such as the use of conservation easements and recording of the location with Sacramento County.
  - After completion of data recovery excavations DWR and Reclamation will prepare a data recovery report. DWR and Reclamation will retain a qualified archaeological consultant to conduct relevant studies specified in the data recovery plan such as obsidian hydration, faunal analysis, and X-ray fluorescence. The consultant or staff archaeologists will synthesize the results of these studies and summarize the results relative to regional research questions in the data recovery report. The report will be filed with the Northeast Information Center. DWR and Reclamation will also store the recovered material at an appropriate site such as the archaeological collections of California State University, Sacramento, or at DWR's offices, for use in future research.
  - The work performed under this mitigation measure will be led or supervised by cultural resource specialists that meet the Secretary of the Department of the Interior's professional qualification standards provided in 36 CFR 61.
  - **Construction phase monitoring:** during construction on or near the resource, DWR and Reclamation will retain a qualified archaeologist to observe excavations over any remaining portions of the deposit that are sensitive for buried human remains. If human remains are discovered the archaeologist will direct compliance with the requirements of California Health and Safety Code Section 7050.5 and California PRC Section 5097.98.

## **Impact CUL-2: Effects on archaeological sites to be identified through future inventory efforts**

An inventory for the majority of the right-of-way for this alternative has not been conducted because the right-of-way is not currently legally accessible (Appendix 4A ). Because several prehistoric archaeological sites qualifying as historical resources have been identified in the footprint of this alternative, the remaining portion of the right-of-way for this conveyance feature is sensitive for previously unidentified archaeological resources. Record searches at the North Central Information Center reviewed the mapped location of previous cultural resource inventories in the footprint of this alternative and the vicinity. This map review revealed that a cultural resources inventory has never been conducted in the majority of the footprint for alternative. The presence of archaeological sites that qualify as historical resources and historic properties in the portion of the footprint that has been previously inspected provides a sample of the likely density and occurrence of resources in the remaining right-of-way. For this reason, additional prehistoric archaeological resources are likely to be found in the portion of the right-of-way where surveys have not been conducted, once access is available and such studies can be completed.

In addition to prehistoric archaeological resources, the BDCP area is sensitive for historic-era archaeological resources. While record searches revealed no recorded historic-era archaeological resources in the right-of-way, it is likely that previously unidentified historic archaeological sites occur in the footprint of this alternative because of the intensity of human activity in the Plan Area during the historic era, as described in Section 18.1.6, *Historic-Era Setting*.

Prehistoric sites in the Plan Area tend to be large and rich in material remains, including human burials and associated ornaments and beads. Habitation debris also often contains both floral and faunal material that can be used for both radiocarbon dating and analysis regarding subsistence strategies. In addition, the large scale of typical prehistoric archaeological resources suggests portions of these deposits will remain with sufficient integrity to convey research information. Therefore, these sites are likely to qualify as historical resources or unique archaeological resources under CEQA and historic properties under Section 106 of the NHPA.

Historic sites are likely to be associated with the historic-era themes of settlement, reclamation, agriculture, and flood management in the Delta region. Because the reclamation and agricultural development of the Delta region provided part of the economic base for the development of surrounding urban centers, these historic themes are significant at both a state and national level. These resources accordingly may contain data useful in historical research. In addition, the intensity of historic activity in the Delta region suggests that many of these resources are likely to be distributed across the footprint of this alternative and some are likely to retain sufficient integrity to convey this significance if they are subject to archaeological excavation and investigation. Therefore, these sites are likely to qualify as historical resources or unique archaeological resources under CEQA and historic properties under Section 106 of the NHPA.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA. The locations of various features such as intakes, forebays, and tunnels shaft locations that would result in ground disturbance are depicted in Figure M3-1 in the mapbook volume. These effects would be adverse.

**CEQA Conclusion:** The right-of-way for this alternative is sensitive for both prehistoric and historic-era resources that cannot be identified at this time because the much of the right-of-way is not legally accessible. Because many of these resources are likely to have data useful in prehistoric and historic archaeological research, as well as the integrity to convey this significance, they are likely to qualify as historical resources or unique archaeological sites under CEQA or historic properties under the Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of these resources by disrupting the spatial associations that could yield important data, resulting in a significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot guarantee that all eligible or significant resources would be preserved in place, or that all important data would be retrieved before construction destroys these resources. The scale of the BDCP, investment into existing designs, and the presence of other important environmental resources such as habitat, natural communities, and wetlands that should be avoided are constraints on the flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

**Mitigation Measure CUL-2: Conduct inventory, evaluation, and treatment of archaeological resources**

Prior to ground-disturbing construction, the BDCP proponents will implement the following mitigation measures:

- Because DWR and Reclamation do not have legal access to the majority of the right-of-way for this alternative, a cultural resource inventory has not been completed for the entire right of way. Prior to ground-disturbing construction, the BDCP proponents will ensure that an inventory and evaluation report for cultural resources is completed within all areas of the right-of-way where effects on archaeological resources may occur.
- The scope of the inventory will include the entire area where effects may occur. Such effects consist of direct disturbance through excavation or indirect damage through vibration or changes to the setting, where the setting may be relevant for archaeological resources.
- The work will be led or supervised by cultural resource specialists that meet the Secretary of the Department of the Interior's professional qualification standards provided in 36 CFR 61.
- Inventory methods will include pedestrian surveys and intermittent subsurface sampling through excavation via augurs or hand excavated units where feasible.
- Identified resources will be mapped and described on forms provided by the California State Parks forms ("DPR" forms). Mapping will be performed by recording data points with GPS hardware that can be imported and managed digitally.
- For all identified resources DWR and Reclamation will evaluate the resources to determine if they are any of the following.
  - Historical resources (State CEQA Guidelines Section 15064.5[a])
  - Unique archaeological resources under CEQA (California PRC Section 21083.2[g])
  - Historic properties (36 CFR Part 60.4)
  - Eligible for local registers
- The recorded resources and the resource evaluations will be summarized in an inventory report. In the inventory report DWR and Reclamation will also determine if individual

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resources qualifying as unique archaeological sites, historical resources, or historic properties will require mitigation to the extent feasible, as described below. DWR will make such a determination if the BDCP would involve any of the following consequences.

- Demolish or materially alter the qualities that make the resource eligible for listing in the CRHR (State CEQA Guidelines Section 15064.5[b][2][A],[C]).
- Demolish or materially alter the qualities that justify the inclusion of the resource on a local register or its identification in an historical resources survey meeting the requirements of California PRC Section 5024.1(g), unless DWR establishes by a preponderance of evidence that the resource is not historically or culturally significant (State CEQA Guidelines Section 15064.5[b][2][B]).
- Alter, directly or indirectly, the qualities that make a resource eligible for listing in the NRHP (36 CFR 800.5[a][1]).
- Demolish or materially impair the qualities that allow a resource to qualify as a unique archaeological site (California PRC Section 21083.2).
- For all resources qualifying as unique archaeological resources, historical resources, or historic properties that would be subject to significant effects, DWR will develop and implement treatment. Such treatment will consist of the following, in order of priority.
  - Preservation in place where feasible, through methods such as redesign of relevant facilities to avoid destruction or damage to eligible cultural resources, capping resources with fill, or deeding resources into conservation easements.
  - Review and study of existing collections previously retrieved from affected resources, where feasible, in lieu of data recovery excavations.
  - Data recovery excavations that retrieve the information that makes the resource eligible for CRHR or NRHP listing, or that qualifies the site as a unique archaeological resource. If data recovery through excavation is the only feasible mitigation, a data recovery plan, which makes provisions for adequately recovering the scientifically consequential information from and about the historical resource, will be prepared and adopted prior to any excavation being undertaken. Such studies will be deposited with the relevant information center of the CHRIS. Excavation as mitigation will be restricted to those parts of the resource that would be damaged or destroyed by the BDCP. If, in the course of data recovery excavations, it is determined that contrary to available evidence, the resource lacks integrity, data recovery excavations will cease. The data recovery plan will specify the basis for the significance of the resource and methods for retrieving the consequential information from the site. After completion of excavation DWR will retain a qualified archaeological consultant to synthesize the findings into a data recovery report describing the findings and will deposit the report at the relevant information center of the CHRIS.
  - It should be noted that this order of priority applies to mitigation on historical resources performed to satisfy CEQA. Reclamation and other federal agencies with management responsibilities for cultural resources shall implement mitigation for adverse effects to satisfy Section 106 of the NHPA, which does not specify this order of priority.

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- The treatment plan will identify treatment methods that are proposed by the Lead Agencies and other public entities. The plan will also specify the basis for selecting a particular mitigation measure.
- For archaeological sites that qualify as historical resources, the BDCP proponents will consider preservation in place as the preferred treatment where feasible.
- If preservation in place of archaeological sites that qualify as historical resources or unique archaeological resources is not feasible in light of costs, logistics, technological considerations, the location of the find, and the extent to which preservation of the find is consistent or inconsistent with the design and objectives of the BDCP, the BDCP proponents will include a discussion in the treatment plan describing why the selected mitigation serves the interests protected by CEQA better than preservation in place.
- **Construction phase monitoring:** during construction on or near resources sensitive for human remains, DWR will retain a qualified archaeologist to observe excavations over any remaining portions of the deposit that are sensitive for buried human remains. If human remains are discovered the archaeologist will direct compliance with the requirements of California Health and Safety Code Section 7050.5 and California PRC Section 5097.98. If Native American human remains are discovered on federal land, work in the immediate vicinity will cease, and DWR will contact the relevant representative of the federal agency where the remains were discovered, as prescribed in 25 USC 3002(d) (NAGPRA). After notification from the relevant agency representative and treatment of the remains as required under NAGPRA, work may continue. Disposition of the remains will follow the ownership priority described in NAGPRA (25 USC 3002[a]).

#### **Impact CUL-3: Effects on archaeological sites that may not be identified through inventory efforts**

Because several archaeological sites qualifying as historical resources have been identified in the footprint of this alternative, the remaining portion of the right-of-way for this conveyance feature is sensitive for previously unidentified prehistoric archaeological resources. While surveys will be completed for the right-of-way, once access is available, such surveys cannot guarantee that all sites will be identified prior to construction. The rapid rate of at which alluvium and sediment accumulates in the Delta region, and the geologically unstable nature of the floodplain and riverbank environments in which these resources may occur makes it likely that numerous sites occur capped below surface soils. Cultural resource inventory efforts cannot always identify such resources, even with intermittent surface excavation designed to reveal sites with little or no surface manifestation because exhaustive sampling to identify every resource is economically and technically infeasible. These sites may also occur buried at the depth at which tunnel boring operations would be performed.

Many of these unidentified prehistoric resources are likely to qualify as historical resources, historic properties, or unique archaeological resources because prehistoric sites in the Delta region tend to be large and contain a rich material culture. In particular, burial features tend to be associated with numerous shell ornaments, charmstones, and associated grave goods. Habitation components often contain abundant faunal and floral remains that elucidate prehistoric adaptations such as subsistence methods.



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In addition to prehistoric archaeological resources, the BDCP area is sensitive for historic-era archaeological resources. Archaeological debris found in historic era archaeological sites activity is likely to be associated with significant themes such as agriculture, reclamation, and settlement of the Delta region. The size of the BDCP area and the intensity of historic activity suggest that some of these resources will qualify as historical resources, historic properties, or unique archaeological resources.

Ground disturbing work, including the construction of surface features such as intakes, and the subterranean tunnel boring operations and shafts may disturb and damage these resources before they can be identified and avoided during monitoring efforts required under Mitigation Measure CUL-3. This damage and disturbance may materially impair these resources within the meaning of CEQA or adversely affect the resources within the meaning of Section 106 because this disturbance would impair the ability of these resources to yield data useful in research. While Mitigation Measure CUL-3 would reduce the potential for this impact, it would not guarantee the impact would be avoided entirely. Therefore, this impact is adverse.

**CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb previously unidentified archaeological sites qualifying as historical resources, historic properties, or unique archaeological resources. Because direct excavation, compaction, or other disturbance may disrupt the spatial associations that contain scientifically useful information it would alter the potential basis for eligibility, thus materially altering the resource and resulting in a significant effect. Because these resources would not be identified prior to construction, they cannot be recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-3 would reduce but not entirely avoid the potential for this impact, by implementing construction worker training, monitoring and discovery protocols. However, because archaeological resources may not be identified prior to disturbance through these measures, the effect cannot be entirely avoided. Therefore, this impact would remain significant and unavoidable.

#### **Mitigation Measure CUL-3: Implement an archaeological resources discovery plan, perform training of construction workers, and conduct construction monitoring**

Prior to ground disturbing construction, the BDCP proponents will include a cultural resources discovery plan in the contract conditions of the construction contractor, incorporating the following actions to be taken in the event of the inadvertent discovery of cultural resources.

- An archaeological monitor will be present to observe construction at geographic locations that are sensitive for unidentified cultural resources. Such locations consist of construction near identified sites (within a 200-foot radius around the known boundaries of identified resources), and where ground disturbing construction will occur within 1,500 feet of major water features.
- In the event of an archaeological resources discovery, work will cease in the immediate vicinity of the find, based on the direction of the archaeological monitor or the apparent distribution of cultural resources if no monitor is present. A qualified archaeologist will assess the significance of the find and make recommendations for further evaluation and treatment as necessary.
- Discovered resources will be mapped and described on forms provided by the California Department of Parks and Recreation (DPR). Mapping will be performed by recording data points with GPS hardware that can be imported and managed digitally.

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- Evaluation and treatment will follow the standards and order of priority described above for Mitigation Measure CUL-2.
- If human remains are discovered as part of the deposit, DWR and the contractors will coordinate with the county coroner and NAHC to make the determinations and perform the management steps prescribed in California Health and Safety Code Section 7050.5 and California PRC Section 5097.98.
- If Native American human remains are discovered on federal land, work in the immediate vicinity will cease, and DWR will contact the relevant representative of the federal agency where the remains were discovered, as prescribed in 25 USC 3002(d) (NAGPRA). After notification from the relevant agency representative and treatment of the remains as required under NAGPRA, work may continue. Disposition of the remains will follow the ownership priority described in NAGPRA (25 USC 3002[a]), as defined below under Mitigation Measure CUL-4.

DWR will include a list of DWR cultural-resources staff that can respond to cultural resource discoveries and provide management direction following discoveries in the construction training materials, and will also provide this list as well as these discovery requirements to the supervisory field staff for the construction workers.

#### **Impact CUL-4: Effects on buried human remains damaged during construction**

The footprint of this alternative is sensitive for buried human remains that may occur in isolation, rather than as part of prehistoric or historic archaeological sites. Historic and prehistoric human remains have been discovered as isolated interments rather than as part of larger sites. Because these isolated resources are not associated with larger deposits, their distribution and depth cannot be estimated. Construction of this alternative would require ground disturbing work that may damage previously unidentified human remains, resulting in direct effects on these resources. While inventory and monitoring efforts are prescribed above under Mitigation Measures CUL-2 and CUL-3, the large acreages subject to disturbance under this alternative make exhaustive sampling to identify all buried and isolated human remains technically and economically infeasible. For these reasons the potential remains that such resources may be damaged before they can be discovered through inventory or monitoring. This effect would be adverse.

**CEQA Conclusion:** This impact would be significant. The Alternative 1A area is sensitive for buried human remains. Construction would likely result in disturbance of these features. Disturbance of human remains, including remains interred outside of cemeteries is considered a significant impact in the CEQA Appendix G checklist, therefore disturbance of these remains would result in a significant effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-significant level because mitigation would not guarantee that these features could be discovered and treated in advance of construction; the scale of construction makes it technically and economically infeasible to perform the level of sampling necessary to identify all such resources prior to construction. Therefore, this impact is considered significant and unavoidable.

#### **Mitigation Measure CUL-4: Follow state and federal law governing human remains if such resources are discovered during construction**

- If human remains are discovered as part of the deposit, the BDCP proponents and the construction contractors will coordinate with the county coroner and NAHC to make the

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determinations and perform the management steps prescribed in California Health and Safety Code Section 7050.5 and California PRC Section 5097.98. This coordination requires the following steps.

- Notification of the county coroner so the coroner may determine if an investigation regarding the cause of death is required. If the coroner determines that the remains are of prehistoric Native American origin, the coroner will notify the NAHC.
- Upon notification the NAHC will identify the MLD, and the MLD will be given the opportunity to reinter the remains with appropriate dignity. If the NAHC fails to identify the MLD or if the parties cannot reach agreement as to how to reinter the remains as described in California PRC Section 5097.98(e), the landowner will reinter the remains at a location not subject to further disturbance. DWR will ensure the protections prescribed in California PRC Section 5097.98(e), are performed, such as the use of conservation easements and recording of the location with the relevant county.
- If Native American human remains are discovered on federal land, work in the immediate vicinity will cease, and DWR will contact the relevant representative of the federal agency where the remains were discovered, as prescribed in 25 USC 3002(d) (NAGPRA). After notification from the relevant agency representative and treatment of the remains as required under NAGPRA, work may continue. Disposition of the remains will follow the ownership priority described in NAGPRA (25 USC 3002[a]):
  - Where the lineal descendants can be found, the lineal descendants own the remains.
  - Where the lineal descendants cannot be found, the remains belong to the Indian tribe on whose land the remains were found.
  - If the remains are discovered on other lands owned or controlled by the federal government and the lineal descendants cannot be determined, the remains belong to the Indian tribe that is culturally affiliated with the remains, or the tribe that aboriginally occupied the land where the remains were discovered.
  - "Indian Tribe" here means federally recognized tribes identified in the list of such tribes published by the Bureau of Indian Affairs in the *Federal Register* as well as in the tribal directory compiled by the BIA.

#### **Impact CUL-5: Direct and indirect effects on eligible and potentially eligible historic architectural/built environment-resources resulting from construction of Conveyance Facilities**

Built environment resources that may be affected by this alternative include resources identified and evaluated in inventory efforts conducted for other projects and resources identified in surveys for the BDCP. These resources are considered historic properties for the purposes of this analysis because they meet the criteria in the NRHP regulations (36 CFR 60.4), as described below. For the same reasons they are considered historical resources under CEQA. Appendix 18 B lists all the individual built environment resources that are potentially eligible and which may be affected by Alternative 1A. A total of 71 built environment resources have the potential to be directly or indirectly affected by construction of this alternative. These resources are spatially distributed across the alignment, but are clustered to some extent, either where large project features such as intakes and the intermediate forebay occur, or where the alignment approaches small towns and other concentrations of resources such as the town of Walnut Grove.

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The following summary discusses the basis for potential eligibility as well as the nature of potential effects for these resources. Many potentially eligible resources are significant under the first NRHP and CRHR criterion because of their association with events that have made a significant contribution to the development of the Delta. Individual significance themes that are relevant to broad patterns of history and heritage include:

- land reclamation and flood management structures;
- early settlement represented by residences and communities, including concentrated settlement of ethnic groups, such as Chinese, Japanese, Filipino, and Portuguese;
- early settlement that represents a town's growth as the commercial or manufacturing/processing focus of the surrounding agricultural area;
- early produce processing plants;
- early agricultural properties that may include a residence or multiple residences, barns, worker housing, ancillary buildings, planted acreage and associated irrigation systems; and;
- transportation infrastructure such as bridges, ferries, roads and trains, that enabled produce to get to market.

The following summary describes resources that qualify under this criterion:

- The Hood Historic District includes a cannery, a railroad spur, two commercial buildings, and thirty single family residences that retain integrity to its historic period from circa 1925 to circa 1945. The cannery is also potentially individually eligible and was the impetus for the development of this community. This alternative would directly impact the cannery, the railroad spur, and the first row of homes and commercial buildings. While the rest of the individual homes that contribute to the district would not be physically impacted, the loss of the cannery would result in the loss of integrity of the district as a whole.
- This alternative crosses twelve islands or reclamation districts, the majority of which were established in the late 19th century. These resources are significant for their association with the historical themes of the reclamation and agricultural development of the Delta. While associated water-control features, such as the levees, weirs, pumps and pump houses have been necessarily updated and maintained, the integrity of land use on these islands is high and has changed little since they were established. All of these islands would be directly affected by this alternative by the construction of new incongruent features such as intakes, the forebay, and ancillary structures.
- Twenty-seven significant ranches/agricultural properties and rural single-family/multiple-family properties will be either directly or indirectly impacted. For the large ranch/agricultural properties, this alternative avoids many of the buildings associated with these properties, impacting only the agricultural land. This is still considered a direct impact because the agricultural land is a character-defining feature of this kind of property. Indirect affects occur when the alternative impacts adjacent property, diminishing historic integrity of the eligible property by altering its visual setting, feeling, and character. Properties under which the tunnel will be passing will not likely be demolished, however impacts from settlement or vibration may result in adverse effects on these resources.
- Rural single-family and multiple-family properties are made up of Delta-style houses, other rural homes at least 45 years old, and grand river-front homes. Again, as with the

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ranches/agricultural properties, these homes will be either directly impacted by this alternative or indirectly impacted by alteration of the setting, which is a character-defining feature of this kind of resource.

In addition, one potentially eligible resource is significant because of its association with people who were influential in the history of the Delta (the second criterion for the NRHP and CRHR). Bacon Island is significant under this criterion for its association with George Shima, a Japanese national that was responsible for much of the agricultural activity in the Delta between 1902 and 1925.

Several resources within this conveyance alignment are significant because they embody stylistic characteristics distinctive to properties found in the Delta and thus qualify under the third criterion for eligibility for the CRHR and NRHP. These resources include levees and water conveyance systems, and bridges that represent technological advances; large agricultural properties that include grand residences, a distinctive barn, and landscaping that represent particular styles of architecture or landscaping; and the modest 19th-century/early 20th-century Delta-style houses built with the main entrance on the second floor in response to historically frequent flooding. The following discussion summarizes properties that meet this criterion:

- Thirteen significant ranches/agricultural properties and rural single-family/multiple-family properties will be either directly or indirectly impacted. For the large ranch/agricultural properties, this alternative avoids many of the buildings associated with these properties, impacting only the agricultural land. This is still considered a direct impact because the agricultural land is a character-defining feature of this kind of property. Indirect effects occur when the alternative impacts adjacent property, diminishing historic integrity of the eligible property by altering its visual setting, feeling, and character. Properties under which the tunnel will be passing will not likely be demolished, however impacts from settlement or vibration may affect some of these resources.
- Rural single-family and multiple-family properties are made up of Delta-style houses, other rural homes at least 45 years old, and grand river-front homes. Again, as with the ranches/agricultural properties, these homes will be either directly impacted by this alternative or indirectly impacted by alteration of the setting, which is a character-defining feature of this kind of resource.

#### **Discussion of Anticipated Effects on Identified Resources**

Direct effects on identified resources associated with this alternative include demolition of these resources to place intakes, tunnel muck work areas, and concrete batch plants adjacent to the alignment. These resources and the effect mechanism (direct or indirect) are provided in Appendix 18B. Even if the resources can be physically avoided they may be subject to indirect effects resulting from permanent changes to the visual setting caused by construction of the nearby intakes, pumping plants, or tunnel muck work areas if the soil is not removed upon the completion of construction and the land restored to its original condition. These new features would cause indirect effects because new facilities would be inconsistent with the rural feeling of the setting that likely contributes, in part, to the significance of these built environment cultural resources. Direct effects may also occur through damage resulting from construction generated vibration. Facility redesign to avoid direct impacts on historic architectural resources is preferred as mitigation if possible. However, it is unlikely that all identified resources can be avoided because of the scale of the BDCP and the need to

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balance avoidance of other important environmental resources such as wetlands, natural communities, and special-status species habitat. These effects would materially impair the resources within the meaning of CEQA and result in adverse effects within the meaning of Section 106 because they would diminish the characteristics that convey the significance of the resources. Direct demolition and indirect effects are likely to occur even with mitigation. Therefore, these effects would be adverse.

**CEQA Conclusion:** Several identified historic-era built environment resources have been identified in the footprint of this alternative (71 individual properties). Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

#### **Mitigation Measure CUL-5: Consult with relevant parties, prepare and implement a built environment treatment plan, and implement treatment**

*[note to reviewers, this mitigation measure will be slightly refined to define which specific resources will be treated after completion of the technical reports for the cultural resource surveys]*

The BDCP proponents shall implement the following measures. All mitigation will be undertaken by individuals that meet the Secretary of the Interior's professional qualifications and have demonstrable experience conducting the following recommended measures. In preparation of the built environment treatment plan (BETP), relevant parties will be consulted. Such parties may include the State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation (ACHP), local historical societies, and other interested parties such as local preservation and community organizations. DWR will perform the following measures as part of mitigation and monitoring for compliance with CEQA. Reclamation and other responsible federal agencies shall perform these measures as part of their management responsibilities performed to satisfy Section 106 of the NHPA.

A BETP will be prepared by an architectural historian and reviewed by relevant parties prior to any demolition or ground-disturbing activity for all built environment resources subject to adverse effects or significant impacts. The following protective measures and monitoring protocols will be implemented for historic resources in close proximity to the project but that are not anticipated to be directly affected by demolition or construction but which may be subject to direct effects such as vibration or inadvertent damage activities :

- Historic Structures Reports (HSR) will be prepared for buildings and structures adjacent to the project for which detailed information is required to develop protection measures. These will be done for buildings and structures that appear to be in poor condition and, therefore, potentially sensitive to construction-related activities such as vibration. Preconstruction stabilization or temporary removal of these buildings may be necessary.

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- Preconstruction condition assessments will be prepared for buildings and structures adjacent to the project that are stable, but could be unintentionally damaged during construction. Should there be any question as to whether or not the project caused damage, these condition assessments will provide confirmation of the preconstruction condition.
- Precautions to protect built resources from construction vehicles, debris and dust may include fencing or debris meshing. Temporary mothballing, and fire and intrusion protection may be needed if the buildings are unoccupied during construction.
- Protective measures will be field checked as needed during construction by a qualified architectural historian. Vibration monitoring may be required for buildings determined to be susceptible to vibration damage that are in close proximity to construction activities or machinery that cause vibration.
- These measures are designed to avoid direct effects such as vibration that may result in structural damage or inadvertent direct effects such as demolition. Structural damage or demolition would otherwise potentially result in an adverse effect because it would impair the ability of the resource to convey its significance associated with the original, intact character and setting.

For built resources that will be directly and adversely impacted, mitigation will include:

- Historic American Building Survey (HABS) records will be prepared for historic buildings and structures that will be demolished. These reports will include written and photographic documentation of the significant and character-defining features of these properties. These reports will minimize the adverse effect by capturing and preserving a description of the significant information and characteristics associated with the resource.
  - All HABS reports are subject to review and approval by the National Park Service. Following approval, the BDCP lead agency will produce sufficient copies for distribution to identified repositories, including the Library of Congress, the California State Library, the University of California Water Resources Center Archives, and any local repositories, as appropriate and agreed upon with the SHPO and interested parties. Distribution will further enhance the mitigation of the adverse effect because it will ensure that the significance is retained and conveyed to a wide audience.
- Historic American Landscape Survey (HALS) records and Historic American Engineering Record (HAER) documents will be prepared for historic water-associated resources. The levees and other linear historic features will be recorded following HAER guidelines. Additionally the settings will be recorded following HALS guidelines. These reports will include written and photographic documentation of the significant and character-defining features of these properties. The HALS and HAER reports will minimize the adverse effect by capturing and retaining a description of the significant engineering and design information associated with the resource.
  - All HALS/HAER reports are subject to review and approval by the National Park Service. Following approval, the BDCP lead agency will produce sufficient copies for distribution to identified repositories, including the Library of Congress, the California State Library, the University of California Water Resources Center Archives, and any local repositories, as appropriate and agreed upon with the California State Historic Preservation Office (SHPO) and interested parties. Distribution will further enhance the mitigation of the

adverse effect because it will ensure that the significance is retained and conveyed to a wide audience.

- Deconstruction and salvage of materials will be performed to the extent feasible to enable the restoration of similar buildings, structures, or water-conveyance features outside of the area of direct impact. Deconstruction and salvage will further minimize adverse effects by using salvaged materials to ensure that similar resources are restored and maintained in manner that will ensure the significance of the resource is preserved.

#### **Impact CUL-6: Direct and indirect effects on unidentified and unevaluated historic architectural/built environment resources resulting from construction activities**

Because DWR does not have legal access to the majority of the footprint for this alternative, inventory efforts in the entire right-of-way have not been completed. Nonetheless, the intensity of activity in the Delta region during the historic era and a review of available data such as aerial photographs suggest that numerous additional resources occur in the right-of-way that have not been identified or which cannot currently be accessed and evaluated.

Review of available data such as aerial photographs, historic topographic maps, and assessors' records also indicates that many of these inaccessible properties are 45 years of age or older and have the potential to be eligible historic resources. Resources that have been identified based upon historic maps, aerial photographs, or other data sources that cannot be currently evaluated are summarized by alternative in Appendix 18B. A total of 37 unevaluated built environment resources have been identified in the footprint of this alternative. Many of these resources are likely to be significant because they may be associated with the important historical themes described above in Section 18.1.6, *Historic-Era Setting*. In addition, such resources may be associated with historically significant persons, or may represent significant artistic values. Thus the resources may have significance under both CEQA (State CEQA Guidelines Section 15064.5[a][3]) and the NRHP (30 CFR 60.4). In addition, because many of the historic-era structures in the Delta region are intact, and retain their rural agricultural setting, many of these resources are likely to have integrity within the meaning of CEQA and the NRHP (14 CCR 4852[c], 30 CFR 60.4). Because many unidentified resources are likely to have significance and integrity, they will qualify as historical resources under CEQA and historic properties under Section 106 of the NHPA.

#### **Anticipated Effects**

Construction may result in direct demolition of these resources, damage through vibration, or indirect effects such as changes to the setting. While mitigation is available to reduce these effects, this mitigation cannot guarantee that all effects would be avoided because mitigation cannot guarantee that eligible resources would be avoided and that adverse changes to the setting would not occur. The scale of the BDCP and other design constraints, such as the presence of other important environmental resources, makes avoidance of all direct and indirect effects unlikely. Therefore, this effect would be adverse.

Traditional cultural properties may also occur within the footprint of this alternative. These resources consist of built environment features or activity areas that are important in the cultural life of a living community. Examples of such resources include local gathering halls and Native American traditional activity areas. Where these resources have both integrity of condition and integrity of relationship, and meet the criteria for listing in the NRHP, they can qualify as historic properties (National Park Service 1998:11–12). Resources that are NRHP-eligible would also be



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historical resources under CEQA (California PRC Section 5024.1[d][1]) Construction has the potential to directly or indirectly damage such resources through demolition or introduction of new inconsistent features into the setting. These changes would impair the ability of the resources to convey their significance because the character defining elements or setting of the resource would be lost. Therefore, impacts on these resources may be adverse.

**CEQA Conclusion:** The BDCP area is sensitive for built environment resources that have not yet been recorded and evaluated because the majority of the BDCP area is legally inaccessible, and inventory efforts have not gathered information in these inaccessible areas. Many of these resources are likely to be associated with important historical themes or persons, or possess high creative values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of these resources remain intact and retain their rural agricultural setting they are also likely to have integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or historical resources under the NHPA and CEQA. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

**Mitigation Measure CUL-6: Conduct a survey of inaccessible properties to assess eligibility, determine if these properties will be adversely impacted by the project, and develop treatment to resolve or mitigate adverse impacts.**

Because DWR does not have legal access to the majority of the right-of-way for this alternative, a built resources inventory has not been completed for the entire right of way for this alternative. Prior to construction, the BDCP proponents will ensure that an inventory and evaluation report is completed within all areas where effects on built resources may occur. This subsequent survey will be conducted in a manner consistent with the May-June 2012 survey.

- The scope of the inventory will include the entire area where effects may occur that were inaccessible in the first survey efforts. Such effects consist of direct disturbance, damage through vibration, or changes to the setting.
- The work will be led or supervised by architectural historians that meet the Secretary of the Department of the Interior's professional qualification standards provided in 36 CFR 61.
- Inventory methods and evaluation will include pedestrian surveys, photographic documentation, historical research using both primary and secondary sources, and interviews and oral histories.
- Newly identified resources will be mapped and described on forms provided by the California Department of Parks and Recreation (DPR). Mapping will be performed by recording data points with GPS hardware that can be imported and managed digitally.
- For all identified resources, DWR will evaluate the resources to determine if they are any of the following.

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- Historical resources (State CEQA Guidelines Section 15064.5[a])
- Significant historic resources under CEQA (California PRC Section 21084.1)
- Historic properties (36 CFR Part 60.4)
- Eligible for local registers
- The recorded resources and the resource evaluations will be summarized in an inventory report. In the inventory report, DWR will also determine if individual resources qualifying as historical resources or historic properties will be subject to significant effects. DWR will make such a finding if the BDCP would result in the following.
  - Demolish or materially alter the qualities that make the resource eligible for listing in the CRHR (State CEQA Guidelines Section 15064.5[b][2][A],[C]).
  - Demolish or materially alter the qualities that justify the inclusion of the resource on a local register or its identification in an historical resources survey meeting the requirements of California PRC Section 5024.1(g), unless DWR establishes by a preponderance of evidence that the resource is not historically or culturally significant (State CEQA Guidelines Section 15064.5[b][2][B]).
  - Alter, directly or indirectly, the qualities that make a resource eligible for listing in the NRHP (36 CFR 800.5[a][1]).
  - Cause a substantial adverse change in the significance of an historical resource (California PRC Section 21084.1).

Where built environment resources that are listed or qualify for listing in the CRHR or NRHP, or that have been designated as locally significant, or are otherwise identified by DWR as historical resources will be subject to significant effects, DWR will prepare a built environment treatment plan. The treatment plan will provide detailed descriptions of treatment measures that will be implemented to avoid, protect, minimize, and mitigate adverse effects on historic properties in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties (36 CFR Part 68) and the National Park Service's Guidelines for the Treatment of Cultural Landscapes. The treatment plan will describe work to be done prior to, during, and after construction.

- Where feasible, DWR will first seek to avoid demolition or materially altering the historical resource by avoidance measures, such as the following.
  - Construction condition assessments or historic structures reports of properties adjacent to construction to determine if these properties are at risk of being damaged.
  - Redesign of relevant facilities to avoid destruction or damage.
  - Determination of tolerable levels of construction vibration
  - Stabilization design and implementation to ensure fragile built resources are not damaged by construction activities
  - Temporarily moving built resources, or other measures determined appropriate.
- If avoidance is not feasible, DWR will implement treatment measures such as the following.
  - Redesign of relevant facilities to minimize the scale or extent of damage to eligible or listed built resources.

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- Design standards to minimize the visual impact and to ensure context-appropriate design.
- Complete documentation in accordance with HABS/HAER/HALS programs, including written and photographic documentation of the significant qualities of the CRHR and NRHP listed and determined eligible districts or individually eligible resources (where resources cannot be avoided).
- Relocation of historic buildings that would otherwise be demolished.
- Following the Secretary of the Interior's standards to restore built resources outside of the area of direct effect that are in-kind with resources that will be demolished by the BDCP.
- Other appropriate treatment methods that are identified in relation to particular resources that are affected.

#### **Impact CUL-7: Effects of conservation measures on cultural resources**

This impact describes the potential effects of other conservation measures at a program level of detail, with the exception of *CM1 Water Facilities and Operation*. The following conservation measures would not result in impacts on cultural resources because they consist of changes to existing activities, or planning and regulatory actions that do not have the potential to result in ground-disturbing work with effects on cultural resources.

- *CM11: Natural Communities Enhancement and Management*
- *CM12: Methylmercury Management*
- *CM13: Invasive Aquatic Vegetation Control*
- *CM14: Stockton Deep Water Ship Channel Dissolved Oxygen Levels*
- *CM15: Predator Control*
- *CM16: Nonphysical Fish Barriers*
- *CM17: Illegal Harvest Reduction*
- *CM19: Urban Stormwater Treatment*
- *M 20: Recreational Users Invasive Species Program*
- *CM21: Nonproject Diversions*
- *CM22: Avoidance and Minimization Measures*

Implementation of the remaining conservation measures could result in effects on prehistoric and historic archaeological resources, as well as TCPs and the built environment because the scope of conservation actions includes large areas of land, and the areas identified for potential restoration or other conservation actions are sensitive for cultural resources, including prehistoric and historic archaeological sites as well as human remains, architectural resources, and rural historic landscapes. Specific conservation actions that would result in foreseeable ground-disturbing work that could alter or impair the significance of NRHP-, CRHR-, or local registry-eligible cultural resources are listed below.

- *CM2: Yolo Bypass Fisheries Enhancement*

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- *CM3: Natural Communities Protection and Restoration*
- *CM4: Tidal Natural Communities Restoration*
- *CM5: Seasonally Inundated Floodplain Restoration*
- *CM6: Channel Margin Enhancement*
- *CM7: Riparian Natural Community Restoration*
- *CM8: Grassland Natural Community Restoration*
- *CM9: Vernal Pool Complex Restoration*
- *CM10: Nontidal Marsh Restoration*
- *CM18: Conservation Hatcheries*

These measures would result in effects on cultural resources when ground-disturbing work is performed to construct improvements and enhance or restore natural communities. Direct effects would occur through demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic archaeological sites, unique archaeological sites, TCPs, human remains, and built environment resources. Indirect effects may occur where changes to the setting alter the existing setting in a manner that is inconsistent with the feeling and association of the resource. For example, reclaimed agricultural landscapes that are converted to habitat may no longer convey the themes of agriculture and settlement, and thus would be inconsistent with remaining features associated with rural historic landscapes created by reclamation, cultivation, and ranching.

Because of the large acreages of land included in all conservation measures that would be implemented under this alternative, it is unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique archaeological sites could be avoided. Therefore, this impact would be adverse. These effects would be material alterations and adverse changes because demolition or alteration of the setting would diminish or destroy the ability of these resources to convey their significance. Mitigation Measure CUL-7 below addresses this effect.

**CEQA Conclusion:** Construction and implementation of conservation measures would result in ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and built environment resources such as historic architectural structures and rural historic landscapes. The same construction may damage unique archaeological sites. This construction would likely result in materially adverse changes for the following reasons:

- ground disturbing construction in archaeological sites disrupts the spatial associations that contain data useful in research, thus diminishing or destroying the basis for the significance of the resource, and;
- ground disturbing construction may either directly demolish or indirectly affect the setting of built environment resources, resulting in an inability of the resource to convey its significance, and;
- ground disturbing construction may either directly demolish or change the setting of traditional cultural properties resulting in an inability of the resource to convey its significance.
- ground disturbing construction may inadvertently disturb human remains.

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The alteration of a resource that changes the characteristics that convey its significance is a material alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under CEQA under the Appendix G checklist. Because this construction would materially alter these categories of resources and disturb human remains it would result in a significant impact. Mitigation is available to reduce these impacts by identifying and evaluating resources, avoiding resources where possible, and developing treatment where avoidance is not possible. In addition construction would be monitored. However, because of the acreage associated with the proposed restoration under conservation measures, as well as the multiple constraints associated with other environmental resources that require mitigation or avoidance, it is unlikely that all cultural resources could be avoided. Therefore, this impact remains significant and unavoidable.

#### **Mitigation Measure CUL-7: Conduct cultural resource studies and adopt cultural resource mitigation measures for cultural resource impacts associated with conservation component implementation**

As part of the site-specific environmental review for all conservation measures other than *CM1 Water Facilities and Operation* that could involve adverse effects on cultural resources within the meaning of NEPA, or significant impacts on cultural resources within the meaning of CEQA, the BDCP proponents will conduct cultural resource studies and develop mitigation measures. The cultural resource studies will include the following steps.

- Record searches at the relevant information centers to retrieve records of identified resources.
- Cultural resource inventories and evaluations that identify archaeological resources and built-environment resources.
- Consultation with the Native American contacts on file with the NAHC and relevant tribes from the list of relevant federally recognized tribes that qualify as *Indian tribes*, as used in 36 CFR 800.16(m), maintained by the Bureau of Indian Affairs (BIA), in order to identify resources that may be known to the Native American community, and to incorporate their preferences for treatment and management.
- Resource-specific evaluations that apply the criteria to determine if the identified resources qualify as historical resources (State CEQA Guidelines Section 15064.5[a]) or unique archaeological resources under CEQA (California PRC Section 21083.2[g]), historic properties (36 CFR Part 60.4), or are eligible for local registers.
- Resource-specific treatment for historical resources, unique archaeological resources, and historic properties that would be materially impaired as defined in CEQA (State CEQA Guidelines Section 15064.5[b][1]) or adversely affected, as defined in the Section 106 regulations (36 CFR 800.5[a][1]).

Treatment and mitigation will include the following elements and steps.

- Treatment for archaeological resources qualifying as historical resources that are subject to significant effects will follow the order of preference described in State CEQA Guidelines Section 15126.4[b][3].
- Treatment for unique archaeological resources subject to significant effects will conform to the mitigation prescribed under CEQA (California PRC Section 21083.2[b])

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- Treatment for historic properties subject to adverse effects will seek to avoid or minimize the consequences of the BDCP that would diminish the characteristics that make the historic property eligible for inclusion in the NRHP.
- Treatment plans or mitigation measures in environmental documents will include monitoring and discovery plans that provide for observation of construction to avoid inadvertent effects on previously unidentified human remains and cultural resources, to the extent feasible.
- Treatment plans or mitigation measures in environmental documents will also include the notification and consultation provisions required for discoveries of human remains provided in California Health and Safety Code Section 7050.5 and California PRC Section 5097.98.
- If Native American human remains are discovered on federal land, work in the immediate vicinity will cease and DWR will contact the relevant representative of the federal agency where the remains were discovered, as prescribed in 25 USC 3002(d) (NAGPRA). After notification from the relevant agency representative and treatment of the remains as required under NAGPRA, work may continue. Disposition of the remains will follow the ownership priority described in NAGPRA (25 USC 3002[a]).

#### **Impact CUL-8: Compatibility of the proposed water conveyance facilities and other conservation measures with plans and policies**

Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could result in the potential for incompatibilities with plans and policies related to protecting cultural resources of the Delta. A number of plans and policies that coincide with the study area provide guidance for protection of cultural resources as overviewed in *Section 18.2.3, Regional and Local Plans, Policies, and Regulations*. This overview of plan and policy compatibility evaluates whether Alternative 1A is compatible or incompatible with these policies, rather than whether impacts are adverse or not adverse or significant or less than significant. The physical and indirect effects of the alternatives on cultural resources are address in Impacts CUL-1 through CUL-7, as described for each alternative. The following comparison analyzes the compatibility of the BDCP with the cultural resource preservation plans and policies of the cities and counties in the region that have adopted such policies. In general, these policies fall into two categories; policies that emphasize preservation or mitigation for effects on significant cultural resources, and policies that specifically emphasize or favor preservation as the preferred management method. For policies that emphasize preservation or mitigation the BDCP will be compatible with these policies for the reasons described below. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely.

- The Alameda County East Area Plan requires that Alameda County design development to avoid cultural resources that contribute to the heritage of the County, or in the alternative to include mitigation to offset impacts to those resources (Alameda County 2000:36). Because the BDCP includes mitigation measures requiring identification of cultural resources, evaluation for the CRHR and NRHP, and mitigation to reduce unavoidable effects, the BDCP would be compatible with this policy.

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- The Yolo County General Plan encourages the preservation and protection of cultural resources where feasible and consultation with Native American tribes (Yolo County 2009:CO-55). The plan specifically encourages identification efforts, avoidance and mitigation to the maximum extent feasible, and consultation with tribes that attach significance to those resources. Because the BDCP includes mitigation measures requiring identification of cultural resources, evaluation for the CRHR and NRHP, consultation with Native American individuals and organizations, and mitigation to reduce unavoidable effects, the BDCP would be compatible with this policy.
- The Contra Costa County General Plan encourages identification and preservation of important cultural resources, preferably in public ownership. While other general plans and policies typically encourage preservation or mitigation, the Contra Costa County General Plan emphasizes preservation (Contra Costa County 2005: 9-11). While the BDCP will require identification, evaluation, and mitigation to the extent feasible, the preservation of all affected cultural resources is infeasible because conflicting constraints such as the location of other significant environmental resources make such avoidance unlikely in every instance. For this reason, the BDCP is not compatible with the Contra Costa County General Plan.
- San Joaquin County has adopted cultural resource protection policies as part of their general plan (San Joaquin County 1992:VI-37). These policies require identification of cultural resources prior to construction where feasible, and assessment of resources identified during construction so that appropriate mitigation may be implemented. The BDCP would be compatible with these policies because cultural resource inventories are in progress for the BDCP, and this section identifies mitigation measures and consultation that will be conducted to manage effects on cultural resources.
- The Sacramento County General Plan includes policies encouraging preservation of important buildings, bridges, and other important structures (Sacramento County 2011:80). The General Plan requires that projects involving structures or districts of architectural importance are referred to the Cultural Resources Committee of the County to recommend appropriate mitigation. The BDCP would be potentially incompatible with these policies because the scale of the project and the constraints associated with mitigation and avoidance for other resources makes protection and avoidance of all significant architectural resources unlikely.
- The Solano County General Plan encourages identification and preservation of important archaeological and built environment resources (Solano County 2008:RS-43). The BDCP would be potentially incompatible with these policies because the scale of the project and the constraints associated with mitigation and avoidance for other resources makes protection and avoidance of all significant architectural resources unlikely.
- The Yolo County General Plan requires identification of important cultural resources, consultation with Native Americans that attach significance to these resources, and avoidance or mitigation for important cultural resources affected by development (Yolo County 2009:CO-55 to CO-56). The General Plan also requires that permitted land uses in the Primary Zone of the Delta are consistent with the policies of the Land Use and Resource Management Plan of the Delta Protection Commission, but these policies do not have specific provisions for cultural resources. The BDCP would be compatible with these policies

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because cultural resource inventories are in progress for the BDCP, and this section identifies mitigation measures and consultation that will be conducted to manage effects on cultural resources

It should be noted that incompatibility with land use policies, is not, by itself, a physical effect on the environment. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations.

**CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by the various counties with jurisdiction in this region. For policies that emphasize preservation or mitigation the BDCP will be compatible with these policies because DWR and Reclamation will implement cultural resource management practices that will identify significant resources, preserve such resources where feasible, and complete mitigation to reduce significant effects where preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations.

### 18.3.5.3 Alternative 1B—Dual Conveyance with East Alignment and Intakes 1–5 (15,000 cfs; Operational Scenario A)

#### Impact CUL-1: Effects on identified archaeological sites resulting from construction of conveyance facilities

##### Identified Resources

Record searches at the CHRIS and inventory efforts have identified 15 previously recorded prehistoric archaeological sites in the footprint of this alternative as described in Appendix 18B. Detailed site descriptions summarizing available information regarding these resources, are provided in Appendix 18B. These sites are distributed more heavily towards the northern and southern end of the alignment.

##### Significance of Identified Prehistoric and Historic Resources

Many of the directly affected sites are midden sites, with debris and artifacts associated with prehistoric habitation and residence activities. Midden sites in the Plan Area are often colloquially referred to as “mound sites” because they often form low mounds elevated relative to the surrounding landform. While the original raised deposit has sometimes been destroyed, midden sites often have substantial deposits below the original raised landform that remain intact that typically contain the material remains associated with prehistoric habitation. This organic debris can be used for radiocarbon dating, as well as material that reveals the nature of subsistence activities pursued by prehistoric populations. Because there is no single unified prehistoric chronology for the Delta region, substantial research questions remain unresolved regarding nature and changes of subsistence and settlement activity over the span of the prehistoric occupation of the Delta. The Delta is the prehistoric point of articulation between Central Valley cultures and the aboriginal people that occupied the San Francisco Bay area. Because the cultural chronology and sources of cultural change for the Delta remain unresolved in part, sites in the footprint of this alternative likely contain information that could help clarify these research issues. For this reason these resources are likely significance under the fourth criterion for the CRHR and NRHP.



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Five of the identified sites contain human burials, as described on the site records. Most if not all of the remaining sites are likely to contain additional burials because midden sites in the Plan Area typically contain human burials or cremations. Burial components within these sites often contain ornaments and other personal items such as charmstones, beads, and other decorative material. Because the style and form of these artifacts change throughout prehistory, and because these stylistic changes have been defined, these materials provide a method of associating archaeological material with specific prehistoric time periods. The ability to associate habitation remains with specific time periods is one of the most significant problems in prehistoric research, because the sequence of specific adaptations and behaviors only becomes clear when a chronology can be constructed that associates behavior and material culture with specific time frames. For this reason these resources are likely significance under the fourth criterion for the CRHR and NRHP.

Because many of these resources are expansive (in excess of 30 meters across), they are each likely to contain some portion of the deposit with sufficient integrity to yield artifacts in their original associations in a manner that will convey these significance themes. Therefore these identified resources are likely to qualify as historical resources under CEQA. For the same reasons, these resources are likely to qualify as historic properties under the NRHP.

#### Anticipated Effects on Identified Resources

The exact location of these resources cannot be disclosed because such disclosure might allow looters to find the sites on the ground and remove archaeological material. However these resources occur within the footprint of both temporary work areas and permanent surface impacts. These sites are distributed more heavily towards the northern and southern end of the alignment. Ground-disturbing construction is likely to disturb the deposits and thus materially their ability to convey their significance. Much of the data potential in archaeological resources exists in the spatial associations of different artifacts and other cultural material. Where artifacts that have known associations with particular time periods occur adjacent to other material such as faunal bone or plant remains from subsistence activity, the proximity of the materials allows an inference as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence strategies during different prehistoric periods. Intrusive ground-disturbing construction may disrupt these associations and thus disrupt the qualities for which the sites qualify as historical resources. For these reasons, construction has the potential to materially impair these resources under CEQA and to adversely affect the resources as defined by Section 106 of the NHPA. This effect would be adverse.

**CEQA Conclusion:** Construction of conveyance facilities would affect identified archaeological resources that occur in the footprint of this alternative. DWR has evaluated these resources and finds they are likely to qualify as historical resources under CEQA, as described in detail in Appendix 18B. This impact would be significant because construction could materially alter or destroy the potential of these resources to yield information useful in archaeological research, the basis for the significance of these resources, through excavation and disruption of the spatial associations that contain meaningful information. Mitigation Measure CUL-1a would reduce this impact, but would not guarantee that all of the scientifically important material would be retrieved because feasible archaeological excavation only typically retrieves a sample of the deposit, and portions of the site may remain after treatment with important information. Construction could damage these remaining portions of the deposit. Therefore, this impact is significant and unavoidable.

**Mitigation Measure CUL-1: Prepare a data recovery plan and perform data recovery excavations on the affected portion of the deposits of identified and significant archaeological sites**

Please refer to Mitigation Measure CUL-1 under Alternative 1A.

**Impact CUL-2: Effects on archaeological sites to be identified through future inventory efforts**

This impact is generally similar to Impact CUL-2 described under Alternative 1A. This alternative is sensitive for previously unidentified archaeological resources that are likely to be significant and to have integrity for the same reasons as described under Alternative 1A. It should be noted however, that the eastern canal would cross more sensitive soil formations and result in continuous ground-disturbance than Alternative 1A, which consists of a tunnel, and Alternative 1C which makes use of a tunnel for a portion of the conveyance alignment. This results in a slightly greater potential to affect unidentified prehistoric archaeological resources compared to Alternative 1A and 1C. Figure 1 in Appendix 18A depicts the eastern canal relative to archaeologically sensitive soil formations. The general sensitivity for historic-era archaeological resources is similar to Alternative 1A.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. The locations of ground disturbing features such as the canal, access roads, pumping plants, borrow areas and concrete batch plants are depicted in Figure M3-2 in the mapbook volume. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of these resources to yield data useful in research. These effects would be adverse.

**CEQA Conclusion:** The right-of-way for this alternative is sensitive for both prehistoric and historic-era resources that cannot be identified at this time because the much of the right-of-way is not legally accessible. Because many of these resources are likely to have data useful in prehistoric and historic archaeological research, as well as the integrity to convey this significance, they are likely to qualify as historical resources or unique archaeological sites under CEQA or historic properties under the Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of these resources by disrupting the spatial associations that could yield important data, resulting in a significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot guarantee that all eligible or significant resources would be preserved in place, or that all important data would be retrieved before construction destroys these resources. The scale of the BDCP, investment into existing designs, and the presence of other important environmental resources such as habitat, natural communities, and wetlands that should be avoided are constraints on the flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

**Mitigation Measure CUL-2: Conduct inventory, evaluation, and treatment of archaeological resources**

Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

### **Impact CUL-3: Effects on archaeological sites that may not be identified through inventory efforts**

Because archaeological sites that are likely to qualify as historical resources and historic properties have been identified in the footprint of this alternative, the remaining portion of the right-of-way for this conveyance feature is sensitive for previously unidentified prehistoric archaeological resources. This sensitivity and the potential impact mechanisms are substantially similar to the sensitivity and impact mechanism described for Alternative 1A. It should be noted however, that the eastern canal would cross more sensitive soil formations and result in continuous ground-disturbance than Alternative 1A, which consists of a tunnel, and Alternative 1C which makes use of a tunnel for a portion of the conveyance alignment. This results in a slightly greater potential to affect unidentified prehistoric archaeological resources compared to Alternative 1A and 1C. Figure 1 in Appendix 18A depicts the eastern canal relative to archaeologically sensitive soil formations. The general sensitivity for historic-era archaeological resources is similar to Alternative 1A.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of these resources to yield data useful in research. These effects would be adverse.

**CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb previously unidentified archaeological sites qualifying as historical resources, historic properties, or unique archaeological resources. Because direct excavation, compaction, or other disturbance may disrupt the spatial associations that contain scientifically useful information it would alter the potential basis for eligibility, thus materially altering the resource and resulting in a significant effect. Because these resources would not be identified prior to construction, they cannot be recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-3 would reduce but not entirely avoid the potential for this impact, by implementing construction worker training, monitoring and discovery protocols. However, because archaeological resources may not be identified prior to disturbance through these measures, the effect cannot be entirely avoided. Therefore, this impact would remain significant and unavoidable.

#### **Mitigation Measure CUL-3: Implement an archaeological resources discovery plan, perform training of construction workers, and conduct construction monitoring**

Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

### **Impact CUL-4: Effects on buried human remains damaged during construction**

The footprint of this alternative is sensitive for buried human remains that may occur in isolation, rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact mechanisms are substantially similar to the sensitivity and impact mechanisms described under Alternative 1A. However, because the eastern canal crosses more sensitive soil formations and may result in greater continuous ground disturbance than the tunnel option or the western canal, the potential for impacts on buried human remains may be slightly higher than described for these other options.

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Ground disturbing construction has the potential to damage and disinter buried human remains, resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect remains adverse.

**CEQA Conclusion:** This impact would be significant. The Alternative 1B area is sensitive for buried human remains. Construction would likely result in disturbance of these features. Disturbance of human remains, including remains interred outside of cemeteries is considered a significant impact in the CEQA Appendix G checklist, therefore disturbance of these remains would result in a significant effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-significant level because mitigation would not guarantee that these features could be discovered and treated in advance of construction; the scale of construction makes it technically and economically infeasible to perform the level of sampling necessary to identify all such resources prior to construction. Therefore, this impact is considered significant and unavoidable.

**Mitigation Measure CUL-4: Follow state and federal law governing human remains if such resources are discovered during construction**

Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

**Impact CUL-5: Direct and indirect effects on eligible and potentially eligible historic architectural/built environment-resources resulting from construction activities**

Previous surveys as well as surveys conducted specifically for the BDPC have identified a number of eligible and potentially eligible built environment resources that may be affected by this alternative. A table of these historically significant properties, their attributes, and whether or not the impacts are direct or indirect can be found in Appendix 18B. A total of ninety-three (93) resources eligible or potentially eligible resources would be affected by this alternative. These built resources include previously identified resources and resources newly determined to appear eligible because they meet the criteria in the NRHP regulations (36 CFR 60.4). These properties also retain enough integrity to convey their historic significance because the setting and character defining features of these resources remain largely intact. While the majority of these properties are located in the northern third of the alignment, in the area south of the San Joaquin River, north of the existing forebay, there are several larger agricultural properties that will be affected.

The following summary discusses the basis for potential eligibility as well as the nature of potential effects for these resources. Many potentially eligible resources are significant under the first NRHP and CRHR criterion because of their association with events that have made a significant contribution to the development of the Delta. Individual significance themes that are relevant to broad patterns of history and heritage include:

- land reclamation and flood management structures;
- early settlement represented by residences and communities, including concentrated settlement of ethnic groups, such as Chinese, Japanese, Filipino, and Portuguese;
- early settlement that represents a town's growth as the commercial or manufacturing/processing focus of the surrounding agricultural area;
- early produce processing plants;

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- early agricultural properties that may include a residence or multiple residences, barns, worker housing, ancillary buildings, planted acreage and associated irrigation systems; and;
- transportation infrastructure such as bridges, ferries, roads and trains, that enabled produce to get to market.

The following summary describes resources that qualify under this criterion:

- The Hood Historic District includes a cannery, a railroad spur, two commercial buildings, and thirty single family residences that retain integrity to its historic period from c1925-c1945. (Thirty-four total resources.) The cannery is also individually eligible and was the impetus for the development of this community. This alternative would directly impact the cannery, the railroad spur, and the first row of homes and commercial buildings. While the rest of the individual homes that contribute to the district would not be physically impacted, the loss of the cannery would result in the loss of integrity of the district as a whole.
- This alternative crosses sixteen islands or reclamation districts, thirteen of which are accessible/partially accessible. Only the accessible islands are included in the count of affected resources. The inaccessible islands are included in the count of inaccessible, likely affected resources (see CUL 7 and appendix 18B). The majority of these islands were established in the late 19<sup>th</sup> century. While associated water-control features, such as the levees, weirs, pumps and pump houses have been necessarily updated and maintained, the integrity of land use on these islands is high and has changed little since they were established. All of these islands would be directly affected by this alternative. These properties are also significant under the third criterion for the CRHR and NRHP, for their design and engineering characteristics.
- Twenty-two significant ranches/agricultural properties and rural single-family/multiple-family properties will be either directly or indirectly impacted.

For the large ranch/agricultural properties, this alternative avoids many of the buildings associated with these properties, impacting only the agricultural land. This is still considered a direct impact because the agricultural land is a character-defining feature of this kind of property.

- Rural single-family and multiple-family properties are made up of Delta-style houses, other rural homes at least 45 years old, and grand river-front homes. Again, as with the ranches/agricultural properties, these homes will be either directly impacted by this alternative or indirectly impacted by alteration of the setting, which is a character-defining feature of this kind of resource.
- One bridge, a wood-trestle railroad bridge, will be directly impacted.
- The Delta Sugar Plant, historically the Amalgamated Sugar Co., is an industrial property that will be indirectly impacted.

Several resources within this alignment are significant because they embody significant engineering and design characteristics (the third criterion for the NRHP and CRHR). Some embody design distinctive to properties found in the Delta such as grand residences and the modest 19th-century/early 20th-century Delta-style houses built with the main entrance on the second floor in response to historically frequent flooding. Other properties include levees and water conveyance systems, and bridges that represent technological advances and important engineering accomplishments for the purposes of reclamation. Several properties are significant under both criterion both the first and third criterion and are included in the property count above. The following are additional affected properties, only eligible under the third criterion:

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- Twenty-one significant ranches/agricultural properties and rural single-family/multiple-family properties will be either directly or indirectly impacted. For the large ranch/agricultural properties, this alternative avoids many of the buildings associated with these properties, impacting only the agricultural land. This is still considered a direct impact because the agricultural land is a character-defining feature of this kind of property. Indirect effects occur when the alternative impacts adjacent property, diminishing historic integrity of the eligible property by altering its visual setting, feeling, and character. Properties under which the tunnel will be passing will not likely be demolished, however vibration and settling may also result in indirect effects.
- One school, Holt Union School, an International Style mid-century building will be directly impacted.

#### Anticipated Effects on Identified Resources

Direct effects on identified resources associated with this alternative include demolition of these resources to construct intakes, transmission lines and the canal itself. Direct effects may also occur through damage resulting from construction-generated vibration which can result in structural damage or foundation subsidence. Even if the resources can be avoided they may be subject to indirect effects resulting from permanent changes to the visual setting caused by construction of the new inconsistent features in the setting. These new features would cause indirect effects because new facilities would be inconsistent with the rural feeling, setting, and association that contributes, in part, to the significance of these built environment cultural resources. These resources and the effect mechanism (direct or indirect) are provided in Appendix 18B. Facility redesign to avoid direct impacts on historic architectural resources is preferred as mitigation if possible. However, it is unlikely that all identified resources can be avoided because of the scale of the BDCP and the need to balance avoidance of other important environmental resources such as wetlands, natural communities, and special-status species habitat. These effects would materially impair the resources within the meaning of CEQA and result in adverse effects within the meaning of Section 106 because they would diminish the characteristics that convey the significance of the resources. Direct demolition and indirect effects are likely to occur even with mitigation. Therefore, these effects would be adverse.

**CEQA Conclusion:** Several identified historic-era built environment resources have been identified in the footprint of this alternative (93 properties). Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

#### **Mitigation Measure CUL-5: Implement a built environment treatment plan, consult with relevant parties, and implement treatment**

Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

### **Impact CUL-6: Direct and indirect effects on unidentified and unevaluated historic architectural/built environment resources resulting from construction activities**

Because DWR does not have legal access to the majority of the footprint for this alternative, inventory efforts in the entire right-of-way have not been completed. Nonetheless, the intensity of activity in the Delta region during the historic era and a review of available data such as aerial photographs suggest that numerous additional resources occur in the right-of-way that have not been identified or which cannot currently be accessed and evaluated.

Review of available data such as aerial photographs, historic topographic maps, and assessors' records indicate that many of these inaccessible properties are 45 years of age or older and have the potential to be eligible historic resources. Resources that have been identified based upon historic maps, aerial photographs, or other data sources that cannot be currently evaluated are summarized by alternative in Appendix 18B.

A total of 72 unevaluated built environment resources have been identified in the footprint of this alternative. Many of these resources are likely to be significant because they may be associated with the important historical themes described above in Section 18.1.6, *Historic-Era Setting*. In addition, such resources may be associated with historically significant persons, or may represent significant artistic values. Thus the resources may have significance under both CEQA (State CEQA Guidelines Section 15064.5[a][3]) and the NRHP (30 CFR 60.4). In addition, because many of the historic-era structures in the Delta region are intact, and retain their rural agricultural setting, many of these resources are likely to have integrity within the meaning of CEQA and the NRHP (14 CCR 4852[c], 30 CFR 60.4). Because many unidentified resources are likely to have significance and integrity, they will qualify as historical resources under CEQA and historic properties under Section 106 of the NHPA.

#### **Anticipated Effects**

Construction may result in direct demolition of these resources, damage through vibration, or indirect effects such as changes to the setting. While mitigation is available to reduce these effects, this mitigation cannot guarantee that all effects would be avoided because mitigation cannot guarantee that eligible resources would be avoided and that adverse changes to the setting would not occur. The scale of the BDCP and other design constraints, such as the presence of other important environmental resources, makes avoidance of all direct and indirect effects unlikely. Therefore, this effect would be adverse.

Traditional cultural properties may also occur within the footprint of this alternative. These resources consist of built environment features or activity areas that are important in the cultural life of a living community. Examples of such resources include local gathering halls and Native American traditional activity areas. Where these resources have both integrity of condition and integrity of relationship, and meet the criteria for listing in the NRHP, they can qualify as historic properties (National Park Service 1998:11–12). Resources that are NRHP-eligible would also be historical resources under CEQA (California PRC Section 5024.1[d][1])

Construction has the potential to directly or indirectly damage built environment resources through demolition or introduction of new inconsistent features into the setting. These changes would impair the ability of the resources to convey their significance because the character defining elements or setting of the resource would be lost. Therefore, impacts on these resources may be adverse.

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**CEQA Conclusion:** The BDCP area is sensitive for built environment resources that have not yet been recorded and evaluated because the majority of the BDCP area is legally inaccessible, and inventory efforts have not gathered information in these inaccessible areas. Many of these resources are likely to be associated with important historical themes or persons, or possess high creative values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of these resources remain intact and retain their rural agricultural setting they are also likely to have integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or historical resources under the NHPA and CEQA. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

**Mitigation Measure CUL-6: Conduct a survey of inaccessible properties to assess eligibility, determine if these properties will be adversely impacted by the project, and include the treatment of these properties in the mitigation plans for known properties to resolve or mitigate adverse impacts.**

Please refer to Mitigation Measure CUL-6 under Alternative 1A.

#### **Impact CUL-7: Effects of conservation measures on cultural resources**

This impact describes the potential effects of other conservation measures at a program level of detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar to Impact CUL-7 as discussed under Alternative 1A because the nature of the affected resources, scope of activities, and geographic area of effects are generally similar. These measures would result in effects on cultural resources when ground-disturbing work is performed to construct improvements and enhance or restore natural communities. Direct effects would occur through demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic archaeological sites, unique archaeological sites, TCPs, human remains, and built environment resources. Indirect effects may occur where changes to the setting alter the existing setting in a manner that is inconsistent with the feeling and association of the resource. Because the ability of the resources to convey their significance would be lost this effect would materially alter these resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural landscapes that are converted to habitat may no longer convey the themes of agriculture and settlement, and thus would be inconsistent with remaining features associated with rural historic landscapes created by reclamation, cultivation, and ranching.

Because of the large acreages of land included in all conservation measures that would be implemented under this alternative, it is unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique archaeological sites could be avoided. Therefore, this impact would be adverse. Mitigation Measure CUL-7 below addresses this effect.



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**CEQA Conclusion:** Construction and implementation of conservation measures would result in ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and built environment resources such as historic architectural structures and rural historic landscapes. The same construction may damage unique archaeological sites. This construction would likely result in materially adverse changes for the following reasons:

- ground disturbing construction in archaeological sites disrupts the spatial associations that contain data useful in research, thus diminishing or destroying the basis for the significance of the resource, and;
- ground disturbing construction may either directly demolish or indirectly affect the setting of built environment resources, resulting in an inability of the resource to convey its significance, and;
- ground disturbing construction may either directly demolish or change the setting of traditional cultural properties resulting in an inability of the resource to convey its significance.
- ground disturbing construction may inadvertently disturb human remains.

The alteration of a resource that changes the characteristics that convey its significance is a material alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under CEQA under the Appendix G checklist. Because this construction would materially alter these categories of resources and disturb human remains it would result in a significant impact. Mitigation is available to reduce these impacts by identifying and evaluating resources, avoiding resources where possible, and developing treatment where avoidance is not possible. In addition construction would be monitored. However, because of the acreage associated with the proposed restoration under conservation measures, as well as the multiple constraints associated with other environmental resources that require mitigation or avoidance, it is unlikely that all cultural resources could be avoided. Therefore, this impact remains significant and unavoidable.

**Mitigation Measure CUL-7: Conduct cultural resource studies and adopt cultural resource mitigation measures for cultural resource impacts associated with conservation component implementation**

Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A

**Impact CUL-8: Compatibility of the proposed water conveyance facilities and other conservation measures with plans and policies**

Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could result in the potential for incompatibilities with plans and policies adopted to protect the cultural resources of the Delta. A number of plans and policies that coincide with the study area provide guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether Alternative 1B is compatible or incompatible with these policies, rather than whether impacts are adverse or not adverse or significant or less than significant. Because Alternative 1B would result in the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the

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BDCP will be compatible with these policies because significant cultural resources will be avoided where feasible, and mitigation will be implemented to reduce effects where avoidance and preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

**CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by the various counties with jurisdiction in this region. For policies that emphasize preservation or mitigation the BDCP will be compatible with these policies because DWR and Reclamation will implement cultural resource management practices that will identify significant resources, preserve such resources where feasible, and complete mitigation to reduce significant effects where preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

### 18.3.5.4 Alternative 1C—Dual Conveyance with West Alignment and Intakes W1–W5 (15,000 cfs; Operational Scenario A)

#### Impact CUL-1: Effects on identified archaeological sites resulting from construction of conveyance facilities

##### Identified Resources

Record searches at the CHRIS and inventory efforts have identified 10 previously recorded prehistoric archaeological sites in the footprint of this alternative as described in Appendix 18B. Detailed site descriptions summarizing available information regarding these resources, are provided in Appendix 18B. In addition, two historic archaeological sites have been identified in the footprint of this alternative; CA-CC0-584H and CA-Yol-165H.

These sites are distributed more heavily towards the northern and southern end of the alignment where ground-disturbing effects of the western canal are concentrated.

##### Significance of Identified Prehistoric and Historic Resources

Many of the directly affected sites are midden sites, with debris and artifacts associated with prehistoric habitation and residence activities. Midden sites in the Plan Area are often colloquially referred to as “mound sites” because they often form low mounds elevated relative to the surrounding landform. While the original raised deposit has sometimes been destroyed, midden sites often have substantial deposits below the original raised landform that remain intact that typically contain the material remains associated with prehistoric habitation. This organic debris can be used for radiocarbon dating, as well as material that reveals the nature of subsistence activities pursued by prehistoric populations. Because there is no single unified prehistoric chronology for the Delta region, substantial research questions remain unresolved regarding nature

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and changes of subsistence and settlement activity over the span of the prehistoric occupation of the Delta. The Delta is the prehistoric point of articulation between Central Valley cultures and the aboriginal people that occupied the San Francisco Bay area. Because the cultural chronology and sources of cultural change for the Delta remain unresolved in part, sites in the footprint of this alternative likely contain information that could help clarify these research issues. For this reason these resources are likely significance under the fourth criterion for the CRHR and NRHP.

Five of the identified sites in the footprint of the western canal contain human burials, as described on the site records. Most if not all of the remaining sites are likely to contain additional burials because midden sites in the Plan Area typically contain human burials or cremations. Burial components within these sites often contain ornaments and other personal items such as charmstones, beads, and other decorative material. Because the style and form of these artifacts change throughout prehistory, and because these stylistic changes have been defined, these materials provide a method of associating archaeological material with specific prehistoric time periods. The ability to associate habitation remains with specific time periods is one of the most significant problems in prehistoric research, because the sequence of specific adaptations and behaviors only becomes clear when a chronology can be constructed that associates behavior and material culture with specific time frames. For this reason these resources are likely significance under the fourth criterion for the CRHR and NRHP.

Because many of these prehistoric resources are expansive (in excess of 30 meters across), they are each likely to contain some portion of the deposit with sufficient integrity to yield artifacts in their original associations in a manner that will convey these significance themes. Therefore these identified resources are likely to qualify as historical resources under CEQA. For the same reasons, these resources are likely to qualify as historic properties under the NRHP.

The historic-era archaeological resources include a deposit (CA-CC0-584H) associated with a work farm operated by George Shima, a significant entrepreneur and farmer in the history of the region, and an the remains of pilings and rip-rap (CA-Yol-165H). Because this site is the associated with a person important in the economic history of the Delta and California, it has significance under the second criterion for the CRHR and NRHP. A site record update for CA-Yol-165H indicates that under a memorandum dated March 23, 2006 "with the California SHPO," the site is not considered a contributing element of the Sacramento River levee system because it lacks integrity of design, setting, materials, workmanship, and feeling (Bell 2006). For these reasons this site is not an historic property, nor is it likely to qualify as an historical resource under CEQA.

#### **Anticipated Effects on Identified Resources**

The exact location of these resources cannot be disclosed because such disclosure might allow looters to find the sites on the ground and remove archaeological material. However these resources occur within the footprint of both temporary work areas and permanent surface impacts. These sites are distributed more heavily towards the northern and southern end of the alignment. Ground-disturbing construction is likely to disturb the deposits and thus materially their ability to convey their significance. Much of the data potential in archaeological resources exists in the spatial associations of different artifacts and other cultural material. Where artifacts that have known associations with particular time periods occur adjacent to other material such as faunal bone or plant remains from subsistence activity, the proximity of the materials allows an inference as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence strategies during different prehistoric periods. Intrusive ground-disturbing construction may

disrupt these associations and thus disrupt the qualities for which the sites qualify as historical resources. For these reasons, construction has the potential to materially impair these resources under CEQA and to adversely affect the resources as defined by Section 106 of the NHPA. This effect would be adverse.

**CEQA Conclusion:** Construction of conveyance facilities would affect identified archaeological resources that occur in the footprint of this alternative. DWR has evaluated these resources and finds they are likely to qualify as historical resources under CEQA, as described in detail in Appendix 18B. This impact would be significant because construction could materially alter or destroy the potential of these resources to yield information useful in archaeological research, the basis for the significance of these resources, through excavation and disruption of the spatial associations that contain meaningful information. Mitigation Measure CUL-1a would reduce this impact, but would not guarantee that all of the scientifically important material would be retrieved because feasible archaeological excavation only typically retrieves a sample of the deposit, and portions of the site may remain after treatment with important information. Construction could damage these remaining portions of the deposit. Therefore, this impact is significant and unavoidable.

**Mitigation Measure CUL-1: Prepare a data recovery plan and perform data recovery excavations on the affected portion of the deposits of identified and significant archaeological sites**

Please refer to Mitigation Measure CUL-1 under Alternative 1A.

**Impact CUL-2: Effects on archaeological sites to be identified through future inventory efforts**

This impact is generally similar to Impact CUL-2 described under Alternative 1A. This alternative is sensitive for previously unidentified archaeological resources that are likely to be significant and to have integrity for the same reasons as described under Alternative 1A. It should be noted however, that the western canal would cross more sensitive soil formations along the northern and southern ends of the alignment compared to Alternative 1A. The middle segment of this alternative would make use of a subterranean tunnel that crosses low-sensitivity soil units. The overall sensitivity for prehistoric archaeological resources may be slightly higher than Alternative 1A because of the relative proportion of high sensitivity geological formations, but the sensitivity for yet-unidentified resources may be slightly lower than the eastern canal (Alternative 1B). Figure 1 in Appendix 18A depicts the western canal relative to archaeologically sensitive soil formations. The general sensitivity for historic-era archaeological resources is similar to Alternative 1A.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. The location of ground disturbing features such as intakes, the canal, tunnel segment, and borrow areas are depicted in Figure M3-3 in the mapbook volume. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of these resources to yield data useful in research. While Mitigation Measure CUL-2 would reduce these effects, it cannot guarantee all effects would be avoided because relocation of proposed facilities to avoid all resources is unlikely. These effects would remain adverse.

**CEQA Conclusion:** The right-of-way for this alternative is sensitive for both prehistoric and historic-era resources that cannot be identified at this time because the much of the right-of-way is not

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legally accessible. Because many of these resources are likely to have data useful in prehistoric and historic archaeological research, as well as the integrity to convey this significance, they are likely to qualify as historical resources or unique archaeological sites under CEQA or historic properties under the Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of these resources by disrupting the spatial associations that could yield important data, resulting in a significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot guarantee that all eligible or significant resources would be preserved in place, or that all important data would be retrieved before construction destroys these resources. The scale of the BDCP, investment into existing designs, and the presence of other important environmental resources such as habitat, natural communities, and wetlands that should be avoided are constraints on the flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

#### **Mitigation Measure CUL-2: Conduct inventory, evaluation, and treatment of archaeological resources**

Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

#### **Impact CUL-3: Effects on archaeological sites that may not be identified through inventory efforts**

Because archaeological sites that are likely to qualify as historical resources and historic properties have been identified in the footprint of this alternative, the remaining portion of the right-of-way for this conveyance feature is sensitive for previously unidentified prehistoric archaeological resources. This sensitivity and the potential impact mechanisms are substantially similar to the sensitivity and impact mechanism described for Alternative 1A. It should be noted however, that the western canal would cross more sensitive soil formations along the northern and southern ends of the alignment compared to Alternative 1A. The portion of the alignment that would cross archaeologically sensitive soil units is slightly lower than the eastern canal. The middle segment of this alternative would make use of a subterranean tunnel that crosses low-sensitivity soil units. Figure 1 in Appendix 18A depicts the western canal relative to archaeologically sensitive soil formations. The general sensitivity for historic-era archaeological resources is similar to Alternative 1A and 1B.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of these resources to yield data useful in research. Mitigation Measure CUL-3 would reduce these effects, but cannot guarantee that all effects would be avoided because inadvertent disturbance of some resources is inevitable given the scale of the proposed construction. These effects would therefore remain adverse.

**CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb previously unidentified archaeological sites qualifying as historical resources, historic properties, or unique archaeological resources. Because direct excavation, compaction, or other disturbance may disrupt the spatial associations that contain scientifically useful information it would alter the potential basis for eligibility, thus materially altering the resource and resulting in a significant effect. Because these resources would not be identified prior to construction, they cannot be

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recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-3 would reduce but not entirely avoid the potential for this impact, by implementing construction worker training, monitoring and discovery protocols. However, because archaeological resources may not be identified prior to disturbance through these measures, the effect cannot be entirely avoided. Therefore, this impact would remain significant and unavoidable.

#### **Mitigation Measure CUL-3: Implement an archaeological resources discovery plan, perform training of construction workers, and conduct construction monitoring**

Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

#### **Impact CUL-4: Effects on buried human remains damaged during construction**

The footprint of this alternative is sensitive for buried human remains that may occur in isolation, rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact mechanisms are substantially similar to the sensitivity and impact mechanisms described under Alternative 1A. However, because the western canal crosses more sensitive soil formations and may result in greater continuous ground disturbance than 1A, the potential for impacts on buried human remains may be slightly higher than described for Alternative 1A, but this sensitivity is not as high as the eastern canal because soil units this alignment crosses may be slightly less sensitive as depicted in Appendix 18.

Ground disturbing construction has the potential to damage and disinter buried human remains, resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect remains adverse.

**CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human remains. Construction would likely result in disturbance of these features. Disturbance of human remains, including remains interred outside of cemeteries is considered a significant impact in the CEQA Appendix G checklist, therefore disturbance of these remains would result in a significant effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-significant level because mitigation would not guarantee that these features could be discovered and treated in advance of construction; the scale of construction makes it technically and economically infeasible to perform the level of sampling necessary to identify all such resources prior to construction. Therefore, this impact is considered significant and unavoidable.

#### **Mitigation Measure CUL-4: Follow state and federal law governing human remains if such resources are discovered during construction**

Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

#### **Impact CUL-5: Direct and indirect effects on eligible and potentially eligible historic architectural/built environment-resources resulting from construction activities**

A total of sixty-six (66) resources would be affected by this alternative. A table of these historically significant properties, their attributes, and whether or not the impacts are direct or indirect can be found in Appendix 18B. These built resources include previously identified resources and resources newly determined to appear eligible because they meet the criteria in the NRHP regulations (36 CFR 60.4). These properties also retain enough integrity to convey their historic significance because the

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setting and character defining features of these properties remain largely intact. While the majority of these properties are located in the northern third of the alignment, the bottom two-thirds include several large agricultural properties spread out along the alternative's corridor.

The following summary discusses the basis for potential eligibility as well as the nature of potential effects for these resources. Many potentially eligible resources are significant under the first NRHP and CRHR criterion because of their association with events that have made a significant contribution to the development of the Delta. Individual significance themes that are relevant to broad patterns of history and heritage include:

- land reclamation and flood management structures;
- early settlement represented by residences and communities, including concentrated settlement of ethnic groups, such as Chinese, Japanese, Filipino, and Portuguese;
- early settlement that represents a town's growth as the commercial or manufacturing/processing focus of the surrounding agricultural area;
- early produce processing plants;
- early agricultural properties that may include a residence or multiple residences, barns, worker housing, ancillary buildings, planted acreage and associated irrigation systems; and;
- transportation infrastructure such as bridges, ferries, roads and trains, that enabled produce to get to market.

The following is a summary of properties within this alternative considered eligible under this criterion:

- A portion of the Hood Historic District would be indirectly impacted by the construction of adjacent project features, including the cannery, two commercial buildings, and six single-family/multi-family residences that retain integrity to its historic period from circa 1925 to 1945 (nine total resources.) The cannery is also individually eligible and was the impetus for the development of this community.
- This alternative crosses eighteen islands or reclamation districts, ten of which are accessible/partially accessible. Only the accessible islands are included in the count of affected resources. The inaccessible islands are included in the count of inaccessible, likely affected resources (see CUL 7 and appendix 18B). The majority of these islands were established in the late 19<sup>th</sup> century. While associated water-control features, such as the levees, weirs, pumps and pump houses have been necessarily updated and maintained, the integrity of land use on these islands is high and has changed little since they were established. All of these islands would be directly affected by this alternative. These properties are also significant under criterion for their design characteristics (the third criterion for the NRHP and CRHR).
- Twenty-two significant ranches/agricultural properties and rural single-family/multiple-family properties will be either directly or indirectly impacted.

For the large ranch/agricultural properties, this alternative avoids many of the buildings associated with these properties, impacting only the agricultural land. This is still considered a direct impact because the agricultural land is a character-defining feature of this kind of property. Indirect affects occur when the alternative impacts adjacent property, diminishing historic integrity of the eligible property by altering its visual setting, feeling, and character.

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Properties under which the tunnel will be passing will not likely be impacted, however impacts from settlement or vibration may result in direct effects on these resources.

Rural single-family and multiple-family properties are made up of Delta-style houses, other rural homes at least 45 years old, and grand river-front homes. Again, as with the ranches/agricultural properties, these homes will be either directly impacted by this alternative or indirectly impacted by alteration of the setting, which is a character-defining feature of this kind of resource.

- The Holland Market, a commercial building previously determined eligible would be indirectly affected.
- Two engineering structures, the Cache Sough "Real McCoy" ferry and a Classical-revival pumping station would both be directly affected.

Several resources within this alignment are significant because they embody significant engineering and design characteristics (the third criterion for the NRHP and CRHR). Some embody design distinctive to properties found in the Delta such as grand residences and the modest 19th-century/early 20th-century Delta-style houses built with the main entrance on the second floor in response to historically frequent flooding. Other properties include levees and water conveyance systems, and bridges that represent technological advances and important engineering accomplishments for the purposes of reclamation. Several properties are significant under both criterion both the first and third criterion and are included in the property count above. The following are additional affected properties, only eligible under the third criterion:

- Twenty-two significant ranches/agricultural properties and rural single-family/multiple-family properties will be either directly or indirectly impacted.

For the large ranch/agricultural properties, this alternative avoids many of the buildings associated with these properties, impacting only the agricultural land. This is still considered a direct impact because the agricultural land is a character-defining feature of this kind of property. Indirect affects occur when the alternative impacts adjacent property, diminishing historic integrity of the eligible property by altering its visual setting, feeling, and character. Properties under which the tunnel will be passing will not likely be impacted, however impacts from settlement or vibration may result from tunnel construction.

Rural single-family and multiple-family properties are made up of Delta-style houses, other rural homes at least 45 years old, and grand river-front homes. Again, as with the ranches/agricultural properties, these homes will be either directly impacted by this alternative or indirectly impacted by alteration of the setting, which is a character-defining feature of this kind of resource.

#### **Anticipated Effects on Identified Resources**

Direct effects on identified resources associated with this alternative include demolition of these resources to place intakes, transmission lines, areas of surface impact, and concrete batch plants and fuel stations adjacent to the alignment. Direct effects may also occur through damage resulting from construction-generated vibration which can result in structural damage or foundation subsidence. Even if the resources can be avoided they may be subject to indirect effects resulting from permanent changes to the visual setting caused by construction of the nearby intakes, transmission lines, poles, and towers, pumping plants, or areas of surface impact if, upon the completion of construction, the land is not restored to its original condition. These new features would cause



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indirect effects because new facilities would be inconsistent with the rural feeling, setting, and association that contributes, in part, to the significance of these built environment cultural resources. Facility redesign to avoid direct impacts on historic architectural resources is preferred as mitigation if possible. However, it is unlikely that all identified resources can be avoided because of the scale of the BDCP and the need to balance avoidance of other important environmental resources such as wetlands, natural communities, and special-status species habitat. These effects would materially impair the resources within the meaning of CEQA and result in adverse effects within the meaning of Section 106 because they would diminish the characteristics that convey the significance of the resources. Direct demolition and indirect effects are likely to occur even with mitigation. Therefore, these effects would be adverse.

**CEQA Conclusion:** Several identified historic-era built environment resources have been identified in the footprint of this alternative (66 properties). Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

#### **Mitigation Measure CUL-5: Implement a built environment treatment plan, consult with relevant parties, and implement treatment**

Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

#### **Impact CUL-6: Direct and indirect effects on unidentified and unevaluated historic architectural/built environment resources resulting from construction activities**

Because DWR does not have legal access to the majority of the footprint for this alternative, inventory efforts in the entire right-of-way have not been completed. Nonetheless, the intensity of activity in the Delta region during the historic era and a review of available data such as aerial photographs suggest that numerous additional resources occur in the right-of-way that have not been identified or which cannot currently be accessed and evaluated.

Review of available data such as aerial photographs, historic topographic maps, and assessors' records indicate that many of these inaccessible properties are 45 years of age or older and have the potential to be eligible historic resources. Resources that have been identified based upon historic maps, aerial photographs, or other data sources that cannot be currently evaluated are summarized by alternative in Appendix 18B. A total of 54 unevaluated built environment resources have been identified in the footprint of this alternative. Many of these resources are likely to be significant because they may be associated with the important historical themes described above in Section 18.1.6, *Historic-Era Setting*. In addition, such resources may be associated with historically significant persons, or may represent significant artistic values. Thus the resources may have significance under both CEQA, and the NRHP. In addition, because many of the historic-era structures in the Delta region are intact, and retain their rural agricultural setting, many of these resources are likely to have integrity within the meaning of CEQA and the NRHP. Because many

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unidentified resources are likely to have significance and integrity, they will qualify as historical resources under CEQA and historic properties under Section 106 of the NHPA.

#### Anticipated Effects

Construction may result in direct demolition of these resources, damage through vibration, or indirect effects such as changes to the setting. While mitigation is available to reduce these effects, this mitigation cannot guarantee that all effects would be avoided because mitigation cannot guarantee that eligible resources would be avoided and that adverse changes to the setting would not occur. The scale of the BDCP and other design constraints, such as the presence of other important environmental resources, makes avoidance of all direct and indirect effects unlikely. Therefore, this effect would be adverse.

Traditional cultural properties may also occur within the footprint of this alternative. These resources consist of built environment features or activity areas that are important in the cultural life of a living community. Examples of such resources include local gathering halls and Native American traditional activity areas. Where these resources have both integrity of condition and integrity of relationship, and meet the criteria for listing in the NRHP, they can qualify as historic properties (National Park Service 1998:11–12). Resources that are NRHP-eligible would also be historical resources under CEQA (California PRC Section 5024.1[d][1])

Construction has the potential to directly or indirectly damage built environment resources through demolition or introduction of new inconsistent features into the setting. These changes would impair the ability of the resources to convey their significance because the character defining elements or setting of the resource would be lost. Therefore, impacts on these resources may be adverse.

**CEQA Conclusion:** The BDCP area is sensitive for built environment resources that have not yet been recorded and evaluated because the majority of the BDCP area is legally inaccessible, and inventory efforts have not gathered information in these inaccessible areas. Many of these resources are likely to be associated with important historical themes or persons, or possess high creative values; therefore, they are likely to have significance under CEQA and the NHPA. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

**Mitigation Measure CUL-6: Conduct a survey of inaccessible properties to assess eligibility, determine if these properties will be adversely impacted by the project, and include the treatment of these properties in the mitigation plans for known properties to resolve or mitigate adverse impacts.**

Please refer to Mitigation Measure CUL-6 under Alternative 1A.

### **Impact CUL-7: Effects of conservation measures on cultural resources**

This impact describes the potential effects of other conservation measures at a program level of detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar to Impact CUL-7 as discussed under Alternative 1A because the nature of the affected resources, scope of activities, and geographic area of effects are generally similar. These measures would result in effects on cultural resources when ground-disturbing work is performed to construct improvements and enhance or restore natural communities. Direct effects would occur through demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic archaeological sites, unique archaeological sites, TCPs, human remains, and built environment resources. Indirect effects may occur where changes to the setting alter the existing setting in a manner that is inconsistent with the feeling and association of the resource. Because the ability of the resources to convey their significance would be lost this effect would materially alter these resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural landscapes that are converted to habitat may no longer convey the themes of agriculture and settlement, and thus would be inconsistent with remaining features associated with rural historic landscapes created by reclamation, cultivation, and ranching.

Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of land included in all conservation measures that would be implemented under this alternative, it is unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique archaeological sites could be avoided. Therefore, this impact would be adverse.

**CEQA Conclusion:** Construction and implementation of conservation measures would result in ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and built environment resources such as historic architectural structures and rural historic landscapes. The same construction may damage unique archaeological sites. This construction would likely result in materially adverse changes for the following reasons:

- ground disturbing construction in archaeological sites disrupts the spatial associations that contain data useful in research, thus diminishing or destroying the basis for the significance of the resource, and;
- ground disturbing construction may either directly demolish or indirectly affect the setting of built environment resources, resulting in an inability of the resource to convey its significance, and;
- ground disturbing construction may either directly demolish or change the setting of traditional cultural properties resulting in an inability of the resource to convey its significance.
- ground disturbing construction may inadvertently disturb human remains.

The alteration of a resource that changes the characteristics that convey its significance is a material alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under CEQA under the Appendix G checklist. Because this construction would materially alter these categories of resources and disturb human remains it would result in a significant impact. Mitigation is available to reduce these impacts by identifying and evaluating resources, avoiding resources where possible, and developing treatment where avoidance is not possible. In addition construction

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would be monitored. However, because of the acreage associated with the proposed restoration under conservation measures, as well as the multiple constraints associated with other environmental resources that require mitigation or avoidance, it is unlikely that all cultural resources could be avoided. Therefore, this impact remains significant and unavoidable.

#### **Mitigation Measure CUL-7: Conduct cultural resource studies and adopt cultural resource mitigation measures for cultural resource impacts associated with conservation component implementation**

Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A

#### **Impact CUL-8: Compatibility of the proposed water conveyance facilities and other conservation measures with plans and policies**

Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could result in the potential for incompatibilities with plans and policies adopted to protect the cultural resources of the Delta. A number of plans and policies that coincide with the study area provide guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether Alternative 1C is compatible or incompatible with these policies, rather than whether impacts are adverse or not adverse or significant or less than significant. Because Alternative 1C would result in the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the BDCP will be compatible with these policies because significant cultural resources will be avoided where feasible, and mitigation will be implemented to reduce effects where avoidance and preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

**CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by the various counties with jurisdiction in this region. For policies that emphasize preservation or mitigation the BDCP will be compatible with these policies because DWR and Reclamation will implement cultural resource management practices that will identify significant resources, preserve such resources where feasible, and complete mitigation to reduce significant effects where preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

### **18.3.5.5 Alternative 2A—Dual Conveyance with Pipeline/Tunnel and Five Intakes (15,000 cfs; Operational Scenario B)**

#### **Impact CUL-1: Effects on identified archaeological sites resulting from construction of conveyance facilities**

##### **Identified Resources**

Record searches at the CHRIS and inventory efforts have identified previously recorded prehistoric archaeological sites in the footprint of this alternative: CA-Sac-56, CA-Sac-57, CA-Sac-59, and CA-Sac-65/H. Record searches also identified an historic archaeological site, CA-SJO-220H, in the footprint of this alternative. Detailed site descriptions summarizing available information regarding these resources, are provided in Appendix 18B. Because the tunnel alignment would be constructed more than 100 feet (30 meters) below the current land surface the resources above the tunnel would not be directly disturbed (no archaeological deposit has been identified in the Delta region that extends from the surface to this depth). Identified resources occurring above the tunnel alignment are not analyzed further because they would not be affected. Collectively, these six previously recorded resources represent the known resources that occur in the footprint of this alternative. The resources are distributed evenly across the alignment, but are somewhat clustered where construction of large above-ground features would occur, such as the northern end of the alignment, at the intermediate forebay, and at the southern end of the alignment.

##### **Significance of Identified Prehistoric and Historic Resources**

The resources affected by this alternative have likely have significance and integrity within the meaning of the NRHP and CRHR for the same reasons described above under Alternative 1A.

##### **Anticipated Effects on Identified Resources**

Ground-disturbing construction is likely to disturb the deposits and thus materially their ability to convey their significance. Much of the data potential in archaeological resources exists in the spatial associations of different artifacts and other cultural material. Where artifacts that have known associations with particular time periods occur adjacent to other material such as faunal bone or plant remains from subsistence activity, the proximity of the materials allows an inference as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence strategies during different prehistoric periods. Intrusive ground-disturbing construction may disrupt these associations and thus disrupt the qualities for which the sites qualify as historical resources. For these reasons, construction has the potential to materially impair these resources under CEQA and to adversely affect the resources as defined by Section 106 of the NHPA. This effect would be adverse.

**CEQA Conclusion:** Construction of conveyance facilities would affect identified archaeological resources that occur in the footprint of this alternative. DWR has evaluated these resources and finds they are likely to qualify as historical resources under CEQA, as described in detail in Appendix 18B. This impact would be significant because construction could materially alter or destroy the potential of these resources to yield information useful in archaeological research, the basis for the significance of these resources, through excavation and disruption of the spatial associations that contain meaningful information. Mitigation Measure CUL-1a would reduce this impact, but would not guarantee that all of the scientifically important material would be retrieved because feasible

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archaeological excavation only typically retrieves a sample of the deposit, and portions of the site may remain after treatment with important information. Construction could damage these remaining portions of the deposit. Therefore, this impact is significant and unavoidable.

**Mitigation Measure CUL-1: Prepare a data recovery plan and perform data recovery excavations on the affected portion of the deposits of identified and significant archaeological sites**

Please refer to Mitigation Measure CUL-1 under Alternative 1A.

**Impact CUL-2: Effects on archaeological sites to be identified through future inventory efforts**

This impact is substantially similar to Impact CUL-2 described under Alternative 1A. While the intake locations would vary, the number of intakes is the same, and thus the overall potential for effects on archaeological resources is similar.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of these resources to yield data useful in research. While Mitigation Measure CUL-2 would reduce these effects, it cannot guarantee all effects would be avoided because relocation of proposed facilities to avoid all resources is unlikely. These effects would remain adverse.

**CEQA Conclusion:** The right-of-way for this alternative is sensitive for both prehistoric and historic-era resources that cannot be identified at this time because the much of the right-of-way is not legally accessible. Because many of these resources are likely to have data useful in prehistoric and historic archaeological research, as well as the integrity to convey this significance, they are likely to qualify as historical resources or unique archaeological sites under CEQA or historic properties under the Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of these resources by disrupting the spatial associations that could yield important data, resulting in a significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot guarantee that all eligible or significant resources would be preserved in place, or that all important data would be retrieved before construction destroys these resources. The scale of the BDCP, investment into existing designs, and the presence of other important environmental resources such as habitat, natural communities, and wetlands that should be avoided are constraints on the flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

**Mitigation Measure CUL-2: Conduct inventory, evaluation, and treatment of archaeological resources**

Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

**Impact CUL-3: Effects on archaeological sites that may not be identified through inventory efforts**

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This impact is substantially similar to Impact CUL-3 described under Alternative 1A. While the intake locations would vary, the number of intakes is the same, and thus the overall potential for effects on archaeological resources is similar.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of these resources to yield data useful in research. Mitigation Measure CUL-3 would reduce these effects, but cannot guarantee that all effects would be avoided because inadvertent disturbance of some resources is inevitable given the scale of the proposed construction. These effects would therefore remain adverse.

**CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb previously unidentified archaeological sites qualifying as historical resources, historic properties, or unique archaeological resources. Because direct excavation, compaction, or other disturbance may disrupt the spatial associations that contain scientifically useful information it would alter the potential basis for eligibility, thus materially altering the resource and resulting in a significant effect. Because these resources would not be identified prior to construction, they cannot be recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-3 would reduce but not entirely avoid the potential for this impact, by implementing construction worker training, monitoring and discovery protocols. However, because archaeological resources may not be identified prior to disturbance through these measures, the effect cannot be entirely avoided. Therefore, this impact would remain significant and unavoidable.

**Mitigation Measure CUL-3: Implement an archaeological resources discovery plan, perform training of construction workers, and conduct construction monitoring**

Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

**Impact CUL-4: Effects on buried human remains damaged during construction**

The footprint of this alternative is sensitive for buried human remains that may occur in isolation, rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact mechanisms are substantially similar to the sensitivity and impact mechanisms described under Alternative 1A. While the intake locations would vary, the number of intakes is the same, and thus the overall potential for effects on buried human remains is similar.

Ground disturbing construction has the potential to damage and disinter buried human remains, resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect remains adverse.

**CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human remains. Construction would likely result in disturbance of these features. Disturbance of human remains, including remains interred outside of cemeteries is considered a significant impact in the CEQA Appendix G checklist, therefore disturbance of these remains would result in a significant effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-significant level because mitigation would not guarantee that these features could be discovered and

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treated in advance of construction; the scale of construction makes it technically and economically infeasible to perform the level of sampling necessary to identify all such resources prior to construction. Therefore, this impact is considered significant and unavoidable.

#### **Mitigation Measure CUL-4: Follow state and federal law governing human remains if such resources are discovered during construction**

Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

#### **Impact CUL-5: Direct and indirect effects on eligible and potentially eligible historic architectural/built environment-resources resulting from construction activities**

A total of forty-one (41) resources would be affected by this alternative. These affected resources are substantially similar to the resources described in Alternative 1A. However, the Hood Historic District, containing thirty-four (34) resources would not be affected. In addition, four of the significant ranches/agricultural properties and rural single-family/multiple-family properties that would be affected by Alternative 1A would not be affected by Alternative 2A, however three additional significant ranches/agricultural properties and rural single-family/multiple-family properties not affected by Alternative 1A would be affected by Alternative 2A. The bridge and five accessible islands are affected by all alternatives under the tunnel option. These built resources include previously identified resources and resources newly determined to appear eligible because they have significance and integrity under the CRHR and NRHP for the same reasons as described under Alternative 1A. These properties also retain enough integrity to convey their historic significance because the setting and character defining features of these resources remain largely intact. The majority of these properties are located in the northern third of the alignment, near the intakes and the northern forebay.

#### **Anticipated Effects on Identified Resources**

Direct effects on identified resources associated with this alternative include demolition of these resources to place intakes, a forebay, transmission towers 95'-100' tall, tunnel muck work areas or other areas of surface impact, and concrete batch plants and fuel stations adjacent to the alignment. Direct effects may also occur through damage resulting from construction-generated vibration which can result in structural damage or foundation subsidence. Even if the resources can be avoided they may be subject to indirect effects resulting from permanent changes to the visual setting caused by construction of the nearby intakes, transmission towers 95'-100' tall, pumping plants, or tunnel muck work areas if the soil is not removed upon the completion of construction and the land restored to its original condition. These new features would cause indirect effects because new facilities would be inconsistent with the rural feeling, setting, and association that contributes, in part, to the significance of these built environment cultural resources. These resources and the effect mechanism (direct or indirect) are provided in Appendix 18B. Facility redesign to avoid direct impacts on historic architectural resources is preferred as mitigation if possible. However, it is unlikely that all identified resources can be avoided because of the scale of the BDCP and the need to balance avoidance of other important environmental resources such as wetlands, natural communities, and special-status species habitat. These effects would materially impair the resources within the meaning of CEQA and result in adverse effects within the meaning of Section 106 because they would diminish the characteristics that convey the significance of the resources. Direct demolition and indirect effects are likely to occur even with mitigation. Therefore, these effects would be adverse.



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**CEQA Conclusion:** Forty-one eligible and potentially eligible historic-era built environment resources have been identified in the footprint of this alternative. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

**Mitigation Measure CUL-5: Implement a built environment treatment plan, consult with relevant parties, and implement treatment**

Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

**Impact CUL-6: Direct and indirect effects on unidentified and unevaluated historic architectural/built environment resources resulting from construction activities**

The footprint of this alternative is sensitive for unidentified and unevaluated built environment resources that may have significance and integrity for the same reasons described under Alternative 1A. A total of 40 unevaluated built environment resources have been identified that may be subject to direct or indirect effects as a result of the construction of this alternative.

**Anticipated Effects**

Construction may result in direct demolition of these resources, damage through vibration, or indirect effects such as changes to the setting. While mitigation is available to reduce these effects, this mitigation cannot guarantee that all effects would be avoided because mitigation cannot guarantee that eligible resources would be avoided and that adverse changes to the setting would not occur. Construction has the potential to directly or indirectly damage built environment resources through demolition or introduction of new inconsistent features into the setting. These changes would impair the ability of the resources to convey their significance because the character defining elements or setting of the resource would be lost. Therefore, impacts on these resources may be adverse.

**CEQA Conclusion:** The BDCP area is sensitive for built environment resources that have not yet been recorded and evaluated because the majority of the BDCP area is legally inaccessible, and inventory efforts have not gathered information in these inaccessible areas. Many of these resources are likely to be associated with important historical themes or persons, or possess high creative values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of these resources remain intact and retain their rural agricultural setting they are also likely to have integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or historical resources under the NHPA and CEQA. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a

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significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

**Mitigation Measure CUL-6: Conduct a survey of inaccessible properties to assess eligibility, determine if these properties will be adversely impacted by the project, and include the treatment of these properties in the mitigation plans for known properties to resolve or mitigate adverse impacts.**

Please refer to Mitigation Measure CUL-6 under Alternative 1A.

#### **Impact CUL-7: Effects of conservation measures on cultural resources**

This impact describes the potential effects of other conservation measures at a program level of detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar to Impact CUL-7 as discussed under Alternative 1A because the nature of the affected resources, scope of activities, and geographic area of effects are generally similar. These measures would result in effects on cultural resources when ground-disturbing work is performed to construct improvements and enhance or restore natural communities. Direct effects would occur through demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic archaeological sites, unique archaeological sites, TCPs, human remains, and built environment resources. Indirect effects may occur where changes to the setting alter the existing setting in a manner that is inconsistent with the feeling and association of the resource. Because the ability of the resources to convey their significance would be lost this effect would materially alter these resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural landscapes that are converted to habitat may no longer convey the themes of agriculture and settlement, and thus would be inconsistent with remaining features associated with rural historic landscapes created by reclamation, cultivation, and ranching.

Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of land included in all conservation measures that would be implemented under this alternative, it is unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique archaeological sites could be avoided. Therefore, this impact would be adverse.

**CEQA Conclusion:** Construction and implementation of conservation measures would result in ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and built environment resources such as historic architectural structures and rural historic landscapes. The same construction may damage unique archaeological sites. This construction would likely result in materially adverse changes for the following reasons:

- ground disturbing construction in archaeological sites disrupts the spatial associations that contain data useful in research, thus diminishing or destroying the basis for the significance of the resource, and;
- ground disturbing construction may either directly demolish or indirectly affect the setting of built environment resources, resulting in an inability of the resource to convey its significance, and;

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- ground disturbing construction may either directly demolish or change the setting of traditional cultural properties resulting in an inability of the resource to convey its significance.
- ground disturbing construction may inadvertently disturb human remains.

The alteration of a resource that changes the characteristics that convey its significance is a material alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under CEQA under the Appendix G checklist. Because this construction would materially alter these categories of resources and disturb human remains it would result in a significant impact. Mitigation is available to reduce these impacts by identifying and evaluating resources, avoiding resources where possible, and developing treatment where avoidance is not possible. In addition construction would be monitored. However, because of the acreage associated with the proposed restoration under conservation measures, as well as the multiple constraints associated with other environmental resources that require mitigation or avoidance, it is unlikely that all cultural resources could be avoided. Therefore, this impact remains significant and unavoidable.

#### **Mitigation Measure CUL-7: Conduct cultural resource studies and adopt cultural resource mitigation measures for cultural resource impacts associated with conservation component implementation**

Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A

#### **Impact CUL-8: Compatibility of the proposed water conveyance facilities and other conservation measures with plans and policies**

Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could result in the potential for incompatibilities with plans and policies adopted to protect the cultural resources of the Delta. A number of plans and policies that coincide with the study area provide guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether Alternative 2A is compatible or incompatible with these policies, rather than whether impacts are adverse or not adverse or significant or less than significant. Because Alternative 2A would result in the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the BDCP will be compatible with these policies because significant cultural resources will be avoided where feasible, and mitigation will be implemented to reduce effects where avoidance and preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

**CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by the various counties with jurisdiction in this region. For policies that emphasize preservation or mitigation the BDCP will be compatible with these policies because DWR and Reclamation will implement cultural resource management practices that will identify significant resources, preserve such resources where feasible, and complete mitigation to reduce significant effects where preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible

because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

### **18.3.5.6 Alternative 2B—Dual Conveyance with East Alignment and Five Intakes (15,000 cfs; Operational Scenario B)**

#### **Impact CUL-1: Effects on identified archaeological sites resulting from construction of conveyance facilities**

##### **Identified Resources**

Record searches at the CHRIS and inventory efforts have identified 14 previously recorded prehistoric archaeological sites in the footprint of this alternative (the same set of sites would be affected as Alternative 1B, except CA-Sac-328). Detailed site descriptions summarizing available information regarding these resources, are provided in Appendix 18B. These sites are distributed more heavily towards the northern and southern end of the alignment.

##### **Significance of Identified Prehistoric and Historic Resources**

The resources affected by this alternative have likely have significance and integrity within the meaning of the NRHP and CRHR for the same reasons described above under Alternative 1B.

##### **Anticipated Effects on Identified Resources**

Ground-disturbing construction is likely to disturb the deposits and thus materially their ability to convey their significance. Much of the data potential in archaeological resources exists in the spatial associations of different artifacts and other cultural material. Where artifacts that have known associations with particular time periods occur adjacent to other material such as faunal bone or plant remains from subsistence activity, the proximity of the materials allows an inference as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence strategies during different prehistoric periods. Intrusive ground-disturbing construction may disrupt these associations and thus disrupt the qualities for which the sites qualify as historical resources. For these reasons, construction has the potential to materially impair these resources under CEQA and to adversely affect the resources as defined by Section 106 of the NHPA. This effect would be adverse.

**CEQA Conclusion:** Construction of conveyance facilities would affect identified archaeological resources that occur in the footprint of this alternative. DWR has evaluated these resources and finds they are likely to qualify as historical resources under CEQA, as described in detail in Appendix 18B. This impact would be significant because construction could materially alter or destroy the potential of these resources to yield information useful in archaeological research, the basis for the significance of these resources, through excavation and disruption of the spatial associations that contain meaningful information. Mitigation Measure CUL-1a would reduce this impact, but would not guarantee that all of the scientifically important material would be retrieved because feasible archaeological excavation only typically retrieves a sample of the deposit, and portions of the site

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may remain after treatment with important information. Construction could damage these remaining portions of the deposit. Therefore, this impact is significant and unavoidable.

#### **Mitigation Measure CUL-1: Prepare a data recovery plan and perform data recovery excavations on the affected portion of the deposits of identified and significant archaeological sites**

Please refer to Mitigation Measure CUL-1 under Alternative 1A.

#### **Impact CUL-2: Effects on archaeological sites to be identified through future inventory efforts**

This impact is generally similar to Impact CUL-2 described under Alternative 1B. This alternative is sensitive for previously unidentified archaeological resources that are likely to be significant and to have integrity for the same reasons as described under Alternative 1B. It should be noted however, that the eastern canal would cross more sensitive soil formations than the tunnel option and result in continuous ground-disturbance that may have a slightly greater potential to affect unidentified prehistoric archaeological resources compared to Alternative 1A and Alternative 1C. Figure 1 in Appendix 18A depicts the eastern canal relative to archaeologically sensitive soil formations. The general sensitivity for historic-era archaeological resources is similar to Alternative 1A.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of these resources to yield data useful in research. The locations of ground disturbing features such as the canal, access roads, pumping plants, borrow areas and concrete batch plants are depicted in Figure M3-2 in the mapbook volume. While Mitigation Measure CUL-2 would reduce these effects, it cannot guarantee all effects would be avoided because relocation of proposed facilities to avoid all resources is unlikely. These effects would remain adverse.

**CEQA Conclusion:** The right-of-way for this alternative is sensitive for both prehistoric and historic-era resources that cannot be identified at this time because the much of the right-of-way is not legally accessible. Because many of these resources are likely to have data useful in prehistoric and historic archaeological research, as well as the integrity to convey this significance, they are likely to qualify as historical resources or unique archaeological sites under CEQA or historic properties under the Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of these resources by disrupting the spatial associations that could yield important data, resulting in a significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot guarantee that all eligible or significant resources would be preserved in place, or that all important data would be retrieved before construction destroys these resources. The scale of the BDCP, investment into existing designs, and the presence of other important environmental resources such as habitat, natural communities, and wetlands that should be avoided are constraints on the flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

#### **Mitigation Measure CUL-2: Conduct inventory, evaluation, and treatment of archaeological resources**

Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

### **Impact CUL-3: Effects on archaeological sites that may not be identified through inventory efforts**

Because archaeological sites that are likely to qualify as historical resources and historic properties have been identified in the footprint of this alternative, the remaining portion of the right-of-way for this conveyance feature is sensitive for previously unidentified prehistoric archaeological resources. This sensitivity and the potential impact mechanisms are substantially similar to the sensitivity and impact mechanism described for Alternative 1B. It should be noted however, that the eastern canal would cross more sensitive soil formations and result in continuous ground-disturbance that may have a slightly greater potential to affect unidentified prehistoric archaeological resources compared to Alternative 1A and Alternative 1C. Figure 1 in Appendix 18A depicts the eastern canal relative to archaeologically sensitive soil formations. The general sensitivity for historic-era archaeological resources is similar to Alternative 1A.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of these resources to yield data useful in research. Mitigation Measure CUL-3 would reduce these effects, but cannot guarantee that all effects would be avoided because inadvertent disturbance of some resources is inevitable given the scale of the proposed construction. These effects would therefore remain adverse.

**CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb previously unidentified archaeological sites qualifying as historical resources, historic properties, or unique archaeological resources. Because direct excavation, compaction, or other disturbance may disrupt the spatial associations that contain scientifically useful information it would alter the potential basis for eligibility, thus materially altering the resource and resulting in a significant effect. Because these resources would not be identified prior to construction, they cannot be recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-3 would reduce but not entirely avoid the potential for this impact, by implementing construction worker training, monitoring and discovery protocols. However, because archaeological resources may not be identified prior to disturbance through these measures, the effect cannot be entirely avoided. Therefore, this impact would remain significant and unavoidable.

#### **Mitigation Measure CUL-3: Implement an archaeological resources discovery plan, perform training of construction workers, and conduct construction monitoring**

Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

### **Impact CUL-4: Effects on buried human remains damaged during construction**

The footprint of this alternative is sensitive for buried human remains that may occur in isolation, rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact mechanisms are substantially similar to the sensitivity and impact mechanisms described under Alternative 1B. However, because the eastern canal crosses more sensitive soil formations and may result in greater continuous ground disturbance than 1A and 1C, the potential for impacts on buried human remains may be slightly higher than described for Alternative 1A.

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Ground disturbing construction has the potential to damage and disinter buried human remains, resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect remains adverse.

**CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human remains. Construction would likely result in disturbance of these features. Disturbance of human remains, including remains interred outside of cemeteries is considered a significant impact in the CEQA Appendix G checklist, therefore disturbance of these remains would result in a significant effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-significant level because mitigation would not guarantee that these features could be discovered and treated in advance of construction; the scale of construction makes it technically and economically infeasible to perform the level of sampling necessary to identify all such resources prior to construction. Therefore, this impact is considered significant and unavoidable.

#### **Mitigation Measure CUL-4: Follow state and federal law governing human remains if such resources are discovered during construction**

Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

#### **Impact CUL-5: Direct and indirect effects on eligible and potentially eligible historic architectural/built environment-resources resulting from construction activities**

A total of fifty-six (56) resources would be affected by this alternative. Identified and potentially eligible historic architectural and built-environment resources affected by this alternative are summarized in Appendix 18B. These affected resources are substantially similar to the resources described in Alternative 2A; however the Hood Historic District, containing thirty-four (34) resources would not be affected. In addition, six of the significant ranches/agricultural properties and rural single-family/multiple-family properties that would be affected by Alternative 2A would not be affected by Alternative 2B; however three additional significant ranches/agricultural properties and rural single-family/multiple-family properties not affected by Alternative 2A would be affected by Alternative 2B. The bridge, the school, the sugar plant, and thirteen accessible islands are affected by all alternatives under the East option. These built resources include previously identified resources and newly identified resources that appear to have significance under the CRHR and NRHP for the same themes described under Alternative 1B. These properties also retain enough integrity to convey their historic significance because the setting and character defining elements remain largely intact. While the majority of these properties are located in the northern third of the alignment, in the area south of the San Joaquin River, north of the existing forebay, there are several larger agricultural properties that will also be affected.

#### **Anticipated Effects on Identified Resources**

Direct effects on identified resources associated with this alternative include demolition of these resources to place intakes, transmission lines, areas of surface impact, and concrete batch plants and fuel stations adjacent to the alignment. Direct effects may also occur through damage resulting from construction-generated vibration which can result in structural damage or foundation subsidence. Even if the resources can be avoided they may be subject to indirect effects resulting from permanent changes to the visual setting caused by construction of the nearby intakes, transmission lines, poles, and towers, pumping plants, or the canal. These new features would cause indirect

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effects because new facilities would be inconsistent with the rural feeling, setting, and association that contributes, in part, to the significance of these built environment cultural resources. These resources and the effect mechanism (direct or indirect) are provided in Appendix 18B. Facility redesign to avoid direct impacts on historic architectural resources is preferred as mitigation if possible. However, it is unlikely that all identified resources can be avoided because of the scale of the BDCP and the need to balance avoidance of other important environmental resources such as wetlands, natural communities, and special-status species habitat. These effects would materially impair the resources within the meaning of CEQA and result in adverse effects within the meaning of Section 106 because they would diminish the characteristics that convey the significance of the resources. Direct demolition and indirect effects are likely to occur even with mitigation. Therefore, these effects would be adverse.

**CEQA Conclusion:** Fifty-six eligible and potentially eligible historic-era built environment resources have been identified in the footprint of this alternative. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

#### **Mitigation Measure CUL-5: Implement a built environment treatment plan, consult with relevant parties, and implement treatment**

Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

#### **Impact CUL-6: Direct and indirect effects on unidentified and unevaluated historic architectural/built environment resources resulting from construction activities**

The footprint of this alternative is sensitive for unidentified and unevaluated built environment resources that may have significance and integrity for the same reasons described under Alternative 1B. A total of 72 unevaluated built environment resources have been identified that may be subject to direct or indirect effects as a result of the construction of this alternative.

#### **Anticipated Effects**

Construction may result in direct demolition of these resources, damage through vibration, or indirect effects such as changes to the setting. While mitigation is available to reduce these effects, this mitigation cannot guarantee that all effects would be avoided because mitigation cannot guarantee that eligible resources would be avoided and that adverse changes to the setting would not occur. Construction has the potential to directly or indirectly damage built environment resources through demolition or introduction of new inconsistent features into the setting. These changes would impair the ability of the resources to convey their significance because the character defining elements or setting of the resource would be lost. Therefore, impacts on these resources may be adverse.



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**CEQA Conclusion:** The BDCP area is sensitive for built environment resources that have not yet been recorded and evaluated because the majority of the BDCP area is legally inaccessible, and inventory efforts have not gathered information in these inaccessible areas. Many of these resources are likely to be associated with important historical themes or persons, or possess high creative values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of these resources remain intact and retain their rural agricultural setting they are also likely to have integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or historical resources under the NHPA and CEQA. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

**Mitigation Measure CUL-6: Conduct a survey of inaccessible properties to assess eligibility, determine if these properties will be adversely impacted by the project, and include the treatment of these properties in the mitigation plans for known properties to resolve or mitigate adverse impacts.**

Please refer to Mitigation Measure CUL-6 under Alternative 1A.

#### **Impact CUL-7: Effects of conservation measures on cultural resources**

This impact describes the potential effects of other conservation measures at a program level of detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar to Impact CUL-7 as discussed under Alternative 1A because the nature of the affected resources, scope of activities, and geographic area of effects are generally similar. These measures would result in effects on cultural resources when ground-disturbing work is performed to construct improvements and enhance or restore natural communities. Direct effects would occur through demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic archaeological sites, unique archaeological sites, TCPs, human remains, and built environment resources. Indirect effects may occur where changes to the setting alter the existing setting in a manner that is inconsistent with the feeling and association of the resource. Because the ability of the resources to convey their significance would be lost this effect would materially alter these resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural landscapes that are converted to habitat may no longer convey the themes of agriculture and settlement, and thus would be inconsistent with remaining features associated with rural historic landscapes created by reclamation, cultivation, and ranching.

Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of land included in all conservation measures that would be implemented under this alternative, it is unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique archaeological sites could be avoided. Therefore, this impact would be adverse.

**CEQA Conclusion:** Construction and implementation of conservation measures would result in ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and built environment resources such as historic architectural structures and rural historic landscapes. The same construction may damage unique archaeological sites. This construction would likely result in materially adverse changes for the following reasons:

- ground disturbing construction in archaeological sites disrupts the spatial associations that contain data useful in research, thus diminishing or destroying the basis for the significance of the resource, and;
- ground disturbing construction may either directly demolish or indirectly affect the setting of built environment resources, resulting in an inability of the resource to convey its significance, and;
- ground disturbing construction may either directly demolish or change the setting of traditional cultural properties resulting in an inability of the resource to convey its significance.
- ground disturbing construction may inadvertently disturb human remains.

The alteration of a resource that changes the characteristics that convey its significance is a material alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under CEQA under the Appendix G checklist. Because this construction would materially alter these categories of resources and disturb human remains it would result in a significant impact. Mitigation is available to reduce these impacts by identifying and evaluating resources, avoiding resources where possible, and developing treatment where avoidance is not possible. In addition construction would be monitored. However, because of the acreage associated with the proposed restoration under conservation measures, as well as the multiple constraints associated with other environmental resources that require mitigation or avoidance, it is unlikely that all cultural resources could be avoided. Therefore, this impact remains significant and unavoidable.

**Mitigation Measure CUL-7: Conduct cultural resource studies and adopt cultural resource mitigation measures for cultural resource impacts associated with conservation component implementation**

Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A

**Impact CUL-8: Compatibility of the proposed water conveyance facilities and other conservation measures with plans and policies**

Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could result in the potential for incompatibilities with plans and policies adopted to protect the cultural resources of the Delta. A number of plans and policies that coincide with the study area provide guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether Alternative 2B is compatible or incompatible with these policies, rather than whether impacts are adverse or not adverse or significant or less than significant. Because Alternative 2B would result in the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the

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BDCP will be compatible with these policies because significant cultural resources will be avoided where feasible, and mitigation will be implemented to reduce effects where avoidance and preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

**CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by the various counties with jurisdiction in this region. For policies that emphasize preservation or mitigation the BDCP will be compatible with these policies because DWR and Reclamation will implement cultural resource management practices that will identify significant resources, preserve such resources where feasible, and complete mitigation to reduce significant effects where preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

### 18.3.5.7 Alternative 2C—Dual Conveyance with West Alignment and Intakes W1-W5 (15,000 cfs; Operational Scenario B)

#### Impact CUL-1: Effects on identified archaeological sites resulting from construction of conveyance facilities

##### Identified Resources

##### Identified Resources

Record searches at the CHRIS and inventory efforts have identified 10 previously recorded prehistoric archaeological sites in the footprint of this alternative as described in Appendix 18B. Detailed site descriptions summarizing available information regarding these resources, are provided in Appendix 18B. In addition, two historic archaeological sites have been identified in the footprint of this alternative; CA-CC0-584H and CA-Yol-165H. This is the same set of resources affected by Alternative 1C.

These sites are distributed more heavily towards the northern and southern end of the alignment where ground-disturbing effects of the western canal are concentrated.

##### Significance of Identified Prehistoric and Historic Resources

The resources affected by this alternative have likely have significance and integrity within the meaning of the NRHP and CRHR for the same reasons described above under Alternative 1C. CA-Yol-165H does not have sufficient integrity to convey significance and therefore does not qualify as an historical resource or historic property.

##### Anticipated Effects on Identified Resources

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Ground-disturbing construction is likely to disturb the deposits and thus materially their ability to convey their significance. Much of the data potential in archaeological resources exists in the spatial associations of different artifacts and other cultural material. Where artifacts that have known associations with particular time periods occur adjacent to other material such as faunal bone or plant remains from subsistence activity, the proximity of the materials allows an inference as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence strategies during different prehistoric periods. Intrusive ground-disturbing construction may disrupt these associations and thus disrupt the qualities for which the sites qualify as historical resources. For these reasons, construction has the potential to materially impair these resources under CEQA and to adversely affect the resources as defined by Section 106 of the NHPA. This effect would be adverse.

**CEQA Conclusion:** Construction of conveyance facilities would affect identified archaeological resources that occur in the footprint of this alternative. DWR has evaluated these resources and finds they are likely to qualify as historical resources under CEQA, as described in detail in Appendix 18B. This impact would be significant because construction could materially alter or destroy the potential of these resources to yield information useful in archaeological research, the basis for the significance of these resources, through excavation and disruption of the spatial associations that contain meaningful information. Mitigation Measure CUL-1a would reduce this impact, but would not guarantee that all of the scientifically important material would be retrieved because feasible archaeological excavation only typically retrieves a sample of the deposit, and portions of the site may remain after treatment with important information. Construction could damage these remaining portions of the deposit. Therefore, this impact is significant and unavoidable.

#### **Mitigation Measure CUL-1: Prepare a data recovery plan and perform data recovery excavations on the affected portion of the deposits of identified and significant archaeological sites**

Please refer to Mitigation Measure CUL-1 under Alternative 1A.

#### **Impact CUL-2: Effects on archaeological sites to be identified through future inventory efforts**

This impact is generally similar to Impact CUL-2 described under Alternative 1C. This alternative is sensitive for previously unidentified archaeological resources that are likely to be significant and to have integrity for the same reasons as described under Alternative 1C. It should be noted however, that the western canal would cross more sensitive soil formations along the northern and southern ends of the alignment compared to Alternative 1A. The middle segment of this alternative would make use of a subterranean tunnel that crosses low-sensitivity soil units. The overall sensitivity for prehistoric archaeological resources may be slightly higher than Alternative 1A because of the relative proportion of high sensitivity geological formations. The overall sensitivity for the western canal may be less than for eastern canal alternatives because the concentration of sensitivity geological formations is higher for the eastern canal. Figure 1 in Appendix 18A depicts the western canal relative to archaeologically sensitive soil formations. The general sensitivity for historic-era archaeological resources is similar to Alternative 1A.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. The location of ground disturbing features such as intakes, the canal, tunnel segment, and borrow areas are depicted in Figure M3-3 in

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the mapbook volume. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of these resources to yield data useful in research. While Mitigation Measure CUL-2 would reduce these effects, it cannot guarantee all effects would be avoided because relocation of proposed facilities to avoid all resources is unlikely. These effects would remain adverse.

**CEQA Conclusion:** The right-of-way for this alternative is sensitive for both prehistoric and historic-era resources that cannot be identified at this time because the much of the right-of-way is not legally accessible. Because many of these resources are likely to have data useful in prehistoric and historic archaeological research, as well as the integrity to convey this significance, they are likely to qualify as historical resources or unique archaeological sites under CEQA or historic properties under the Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of these resources by disrupting the spatial associations that could yield important data, resulting in a significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot guarantee that all eligible or significant resources would be preserved in place, or that all important data would be retrieved before construction destroys these resources. The scale of the BDCP, investment into existing designs, and the presence of other important environmental resources such as habitat, natural communities, and wetlands that should be avoided are constraints on the flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

#### **Mitigation Measure CUL-2: Conduct inventory, evaluation, and treatment of archaeological resources**

Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

#### **Impact CUL-3: Effects on archaeological sites that may not be identified through inventory efforts**

Because archaeological sites that are likely to qualify as historical resources and historic properties have been identified in the footprint of this alternative, the remaining portion of the right-of-way for this conveyance feature is sensitive for previously unidentified prehistoric archaeological resources. This sensitivity and the potential impact mechanisms are substantially similar to the sensitivity and impact mechanism described for Alternative 1C. It should be noted however, that the western canal would cross more sensitive soil formations along the northern and southern ends of the alignment compared to Alternative 1A. The middle segment of this alternative would make use of a subterranean tunnel that crosses low-sensitivity soil units. The overall sensitivity for prehistoric archaeological resources may be slightly higher than Alternative 1A because of the relative proportion of high sensitivity geological formations. The overall sensitivity may be lower relative to the eastern canal options. Figure 1 in Appendix 18A depicts the western canal relative to archaeologically sensitive soil formations. The general sensitivity for historic-era archaeological resources is similar to Alternative 1A.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of

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these resources to yield data useful in research. Mitigation Measure CUL-3 would reduce these effects, but cannot guarantee that all effects would be avoided because inadvertent disturbance of some resources is inevitable given the scale of the proposed construction. These effects would therefore remain adverse.

**CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb previously unidentified archaeological sites qualifying as historical resources, historic properties, or unique archaeological resources. Because direct excavation, compaction, or other disturbance may disrupt the spatial associations that contain scientifically useful information it would alter the potential basis for eligibility, thus materially altering the resource and resulting in a significant effect. Because these resources would not be identified prior to construction, they cannot be recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-3 would reduce but not entirely avoid the potential for this impact, by implementing construction worker training, monitoring and discovery protocols. However, because archaeological resources may not be identified prior to disturbance through these measures, the effect cannot be entirely avoided. Therefore, this impact would remain significant and unavoidable.

#### **Mitigation Measure CUL-3: Implement an archaeological resources discovery plan, perform training of construction workers, and conduct construction monitoring**

Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

#### **Impact CUL-4: Effects on buried human remains damaged during construction**

The footprint of this alternative is sensitive for buried human remains that may occur in isolation, rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact mechanisms are substantially similar to the sensitivity and impact mechanisms described under Alternative 1A. However, because the western canal crosses more sensitive soil formations and may result in greater continuous ground disturbance than 1A, the potential for impacts on buried human remains may be slightly higher than described for Alternative 1A. Because the western canal crosses slightly lower sensitivity soil formations it may be slightly less sensitive for buried human remains relative to eastern canal options. Figure 1 in Appendix 18 depicts geological map units relative to the alignments.

Ground disturbing construction has the potential to damage and disinter buried human remains, resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect remains adverse.

**CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human remains. Construction would likely result in disturbance of these features. Disturbance of human remains, including remains interred outside of cemeteries is considered a significant impact in the CEQA Appendix G checklist, therefore disturbance of these remains would result in a significant effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-significant level because mitigation would not guarantee that these features could be discovered and treated in advance of construction; the scale of construction makes it technically and economically infeasible to perform the level of sampling necessary to identify all such resources prior to construction. Therefore, this impact is considered significant and unavoidable.

#### **Mitigation Measure CUL-4: Follow state and federal law governing human remains if such resources are discovered during construction**

Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

#### **Impact CUL-5: Direct and indirect effects on eligible and potentially eligible historic architectural/built environment-resources resulting from construction activities**

A total of fifty-six (56) resources would be affected by this alternative. A table of these historically significant properties, their attributes, and whether or not the impacts are direct or indirect can be found in Appendix 18B. These affected resources are substantially similar to the resources described in Alternative 1C, however the Hood Historic District, containing thirty-four (34) resources would not be affected. In addition, six of the significant ranches/agricultural properties and rural single-family/multiple-family properties that would be affected by Alternative 1C would not be affected by Alternative 2C, however three additional significant ranches/agricultural properties and rural single-family/multiple-family properties not affected by Alternative 1C would be affected by Alternative 2C. The bridge, the school, the sugar plant, and thirteen accessible islands are affected by all alternatives under the East option. These built resources include previously identified resources and resources newly determined to appear eligible because they meet the criteria in the NRHP regulations (36 CFR 60.4) under the same significance themes described under Alternative 1C. These properties also retain enough integrity to convey their historic significance because the setting and character defining features of these properties remain largely intact. While the majority of these properties are located in the northern third of the alignment, in the area south of the San Joaquin River, north of the existing forebay, there are several larger agricultural properties that will also be affected.

#### **Anticipated Effects on Identified Resources**

Direct effects on identified resources associated with this alternative include demolition of these resources to place intakes, areas of surface impact, transmission lines, and concrete batch plants and fuel stations adjacent to the alignment. Direct effects may also occur through damage resulting from construction-generated vibration which can result in structural damage or foundation subsidence. Even if the resources can be avoided they may be subject to indirect effects resulting from permanent changes to the visual setting caused by construction of the nearby intakes, transmission lines, poles, and towers, pumping plants, or areas of surface impact if, upon the completion of construction, the land is not restored to its original condition. These new features would cause indirect effects because new facilities would be inconsistent with the rural feeling, setting, and association that contributes, in part, to the significance of these built environment cultural resources. These resources and the effect mechanism (direct or indirect) are provided in Appendix 18B. Facility redesign to avoid direct impacts on historic architectural resources is preferred as mitigation if possible. However, it is unlikely that all identified resources can be avoided because of the scale of the BDCP and the need to balance avoidance of other important environmental resources such as wetlands, natural communities, and special-status species habitat. These effects would materially impair the resources within the meaning of CEQA and result in adverse effects within the meaning of Section 106 because they would diminish the characteristics that convey the significance of the resources. Direct demolition and indirect effects are likely to occur even with mitigation. Therefore, these effects would be adverse.

**CEQA Conclusion:** Fifty-six eligible and potentially eligible historic-era built environment resources have been identified in the footprint of this alternative. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

**Mitigation Measure CUL-5: Implement a built environment treatment plan, consult with relevant parties, and implement treatment**

Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

**Impact CUL-6: Direct and indirect effects on unidentified and unevaluated historic architectural/built environment resources resulting from construction activities**

The footprint of this alternative is sensitive for unidentified and unevaluated built environment resources that may have significance and integrity for the same reasons described under Alternative 1C. A total of 68 unevaluated built environment resources have been identified that may be subject to direct or indirect effects as a result of the construction of this alternative.

**Anticipated Effects**

Construction may result in direct demolition of these resources, damage through vibration, or indirect effects such as changes to the setting. While mitigation is available to reduce these effects, this mitigation cannot guarantee that all effects would be avoided because mitigation cannot guarantee that eligible resources would be avoided and that adverse changes to the setting would not occur. Construction has the potential to directly or indirectly damage built environment resources through demolition or introduction of new inconsistent features into the setting. These changes would impair the ability of the resources to convey their significance because the character defining elements or setting of the resource would be lost. Therefore, impacts on these resources may be adverse.

**CEQA Conclusion:** The BDCP area is sensitive for built environment resources that have not yet been recorded and evaluated because the majority of the BDCP area is legally inaccessible, and inventory efforts have not gathered information in these inaccessible areas. Many of these resources are likely to be associated with important historical themes or persons, or possess high creative values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of these resources remain intact and retain their rural agricultural setting they are also likely to have integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or historical resources under the NHPA and CEQA. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character,



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resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

**Mitigation Measure CUL-6: Conduct a survey of inaccessible properties to assess eligibility, determine if these properties will be adversely impacted by the project, and include the treatment of these properties in the mitigation plans for known properties to resolve or mitigate adverse impacts.**

Please refer to Mitigation Measure CUL-6 under Alternative 1A.

#### **Impact CUL-7: Effects of conservation measures on cultural resources**

This impact describes the potential effects of other conservation measures at a program level of detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar to Impact CUL-7 as discussed under Alternative 1A because the nature of the affected resources, scope of activities, and geographic area of effects are generally similar. These measures would result in effects on cultural resources when ground-disturbing work is performed to construct improvements and enhance or restore natural communities. Direct effects would occur through demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic archaeological sites, unique archaeological sites, TCPs, human remains, and built environment resources. Indirect effects may occur where changes to the setting alter the existing setting in a manner that is inconsistent with the feeling and association of the resource. Because the ability of the resources to convey their significance would be lost this effect would materially alter these resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural landscapes that are converted to habitat may no longer convey the themes of agriculture and settlement, and thus would be inconsistent with remaining features associated with rural historic landscapes created by reclamation, cultivation, and ranching.

Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of land included in all conservation measures that would be implemented under this alternative, it is unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique archaeological sites could be avoided. Therefore, this impact would be adverse.

**CEQA Conclusion:** Construction and implementation of conservation measures would result in ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and built environment resources such as historic architectural structures and rural historic landscapes. The same construction may damage unique archaeological sites. This construction would likely result in materially adverse changes for the following reasons:

- ground disturbing construction in archaeological sites disrupts the spatial associations that contain data useful in research, thus diminishing or destroying the basis for the significance of the resource, and;

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- ground disturbing construction may either directly demolish or indirectly affect the setting of built environment resources, resulting in an inability of the resource to convey its significance, and;
- ground disturbing construction may either directly demolish or change the setting of traditional cultural properties resulting in an inability of the resource to convey its significance.
- ground disturbing construction may inadvertently disturb human remains.

The alteration of a resource that changes the characteristics that convey its significance is a material alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under CEQA under the Appendix G checklist. Because this construction would materially alter these categories of resources and disturb human remains it would result in a significant impact. Mitigation is available to reduce these impacts by identifying and evaluating resources, avoiding resources where possible, and developing treatment where avoidance is not possible. In addition construction would be monitored. However, because of the acreage associated with the proposed restoration under conservation measures, as well as the multiple constraints associated with other environmental resources that require mitigation or avoidance, it is unlikely that all cultural resources could be avoided. Therefore, this impact remains significant and unavoidable.

#### **Mitigation Measure CUL-7: Conduct cultural resource studies and adopt cultural resource mitigation measures for cultural resource impacts associated with conservation component implementation**

Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A

#### **Impact CUL-8: Compatibility of the proposed water conveyance facilities and other conservation measures with plans and policies**

Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could result in the potential for incompatibilities with plans and policies adopted to protect the cultural resources of the Delta. A number of plans and policies that coincide with the study area provide guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether Alternative 2C is compatible or incompatible with these policies, rather than whether impacts are adverse or not adverse or significant or less than significant. Because Alternative 2C would result in the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the BDCP will be compatible with these policies because significant cultural resources will be avoided where feasible, and mitigation will be implemented to reduce effects where avoidance and preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

**CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by the various counties with jurisdiction in this region. For policies that emphasize preservation or

mitigation the BDCP will be compatible with these policies because DWR and Reclamation will implement cultural resource management practices that will identify significant resources, preserve such resources where feasible, and complete mitigation to reduce significant effects where preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

### **18.3.5.8 Alternative 3—Dual Conveyance with Pipeline/Tunnel and Intakes 1 and 2 (6,000 cfs; Operational Scenario A)**

#### **Impact CUL-1: Effects on identified archaeological sites resulting from construction of conveyance facilities**

##### **Identified Resources**

Record searches at the CHRIS and inventory efforts have identified the following previously recorded prehistoric archaeological sites in the footprint of this alternative: CA-Sac-57, CA-Sac-59, and CA-Sac-65/H. Record searches also identified an historic archaeological site, CA-SJO-220H, in the footprint of this alternative. Detailed site descriptions summarizing available information regarding these resources, are provided in Appendix 18B. Because the tunnel alignment would be constructed more than 100 feet (30 meters) below the current land surface the resources above the tunnel would not be directly disturbed (no archaeological deposit has been identified in the Delta region that extends from the surface to this depth). Identified resources occurring above the tunnel alignment are not analyzed further because they would not be affected. Collectively, these six previously recorded resources represent the known resources that occur in the footprint of this alternative. The resources are distributed evenly across the alignment, but are somewhat clustered where construction of large above-ground features would occur, such as the northern end of the alignment, at the intermediate forebay, and at the southern end of the alignment.

##### **Significance of Identified Prehistoric and Historic Resources**

The resources affected by this alternative have likely have significance and integrity within the meaning of the NRHP and CRHR for the same reasons described above under Alternative 1A.

##### **Anticipated Effects on Identified Resources**

Ground-disturbing construction is likely to disturb the deposits and thus materially their ability to convey their significance. Much of the data potential in archaeological resources exists in the spatial associations of different artifacts and other cultural material. Where artifacts that have known associations with particular time periods occur adjacent to other material such as faunal bone or plant remains from subsistence activity, the proximity of the materials allows an inference as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence strategies during different prehistoric periods. Intrusive ground-disturbing construction may disrupt these associations and thus disrupt the qualities for which the sites qualify as historical resources. For these reasons, construction has the potential to materially impair these resources

under CEQA and to adversely affect the resources as defined by Section 106 of the NHPA. This effect would be adverse.

**CEQA Conclusion:** Construction of conveyance facilities would affect identified archaeological resources that occur in the footprint of this alternative. DWR has evaluated these resources and finds they are likely to qualify as historical resources under CEQA, as described in detail in Appendix 18B. This impact would be significant because construction could materially alter or destroy the potential of these resources to yield information useful in archaeological research, the basis for the significance of these resources, through excavation and disruption of the spatial associations that contain meaningful information.. Mitigation Measure CUL-1a would reduce this impact, but would not guarantee that all of the scientifically important material would be retrieved because feasible archaeological excavation only typically retrieves a sample of the deposit, and portions of the site may remain after treatment with important information. Construction could damage these remaining portions of the deposit. Therefore, this impact is significant and unavoidable.

**Mitigation Measure CUL-1: Prepare a data recovery plan and perform data recovery excavations on the affected portion of the deposits of identified and significant archaeological sites**

Please refer to Mitigation Measure CUL-1 under Alternative 1A.

**Impact CUL-2: Effects on archaeological sites to be identified through future inventory efforts**

This impact is substantially similar to Impact CUL-2 described under Alternative 1A. While the number of intakes would be reduced, slightly reducing the footprint the overall potential for effects on archaeological resources is similar.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of these resources to yield data useful in research. While Mitigation Measure CUL-2 would reduce these effects, it cannot guarantee all effects would be avoided because relocation of proposed facilities to avoid all resources is unlikely. The locations of various features such as intakes, forebays, and tunnels shaft locations are depicted in Figure M3-1 in the mapbook volume. These effects would remain adverse.

**CEQA Conclusion:** The right-of-way for this alternative is sensitive for both prehistoric and historic-era resources that cannot be identified at this time because the much of the right-of-way is not legally accessible. Because many of these resources are likely to have data useful in prehistoric and historic archaeological research, as well as the integrity to convey this significance, they are likely to qualify as historical resources or unique archaeological sites under CEQA or historic properties under the Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of these resources by disrupting the spatial associations that could yield important data, resulting in a significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot guarantee that all eligible or significant resources would be preserved in place, or that all important data would be retrieved before construction destroys these resources. The scale of the BDCP, investment into existing designs, and the presence of other important environmental resources such as habitat, natural communities, and wetlands that should be avoided are constraints

on the flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

**Mitigation Measure CUL-2: Conduct inventory, evaluation, and treatment of archaeological resources**

Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

**Impact CUL-3: Effects on archaeological sites that may not be identified through inventory efforts**

This impact is substantially similar to Impact CUL-3 described under Alternative 1A. While the number of intakes would be reduced, slightly reducing the footprint the overall potential for effects on archaeological resources is similar.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of these resources to yield data useful in research. Mitigation Measure CUL-3 would reduce these effects, but cannot guarantee that all effects would be avoided because inadvertent disturbance of some resources is inevitable given the scale of the proposed construction. These effects would therefore remain adverse.

**CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb previously unidentified archaeological sites qualifying as historical resources, historic properties, or unique archaeological resources. Because direct excavation, compaction, or other disturbance may disrupt the spatial associations that contain scientifically useful information it would alter the potential basis for eligibility, thus materially altering the resource and resulting in a significant effect. Because these resources would not be identified prior to construction, they cannot be recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-3 would reduce but not entirely avoid the potential for this impact, by implementing construction worker training, monitoring and discovery protocols. However, because archaeological resources may not be identified prior to disturbance through these measures, the effect cannot be entirely avoided. Therefore, this impact would remain significant and unavoidable.

**Mitigation Measure CUL-3: Implement an archaeological resources discovery plan, perform training of construction workers, and conduct construction monitoring**

Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

**Impact CUL-4: Effects on buried human remains damaged during construction**

The footprint of this alternative is sensitive for buried human remains that may occur in isolation, rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact mechanisms are substantially similar to the sensitivity and impact mechanisms described under Alternative 1A. While the number of intakes would be reduced, slightly reducing the footprint the overall potential for effects on buried human resources is similar.

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Ground disturbing construction has the potential to damage and disinter buried human remains, resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect remains adverse.

**CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human remains. Construction would likely result in disturbance of these features. Disturbance of human remains, including remains interred outside of cemeteries is considered a significant impact in the CEQA Appendix G checklist, therefore disturbance of these remains would result in a significant effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-significant level because mitigation would not guarantee that these features could be discovered and treated in advance of construction; the scale of construction makes it technically and economically infeasible to perform the level of sampling necessary to identify all such resources prior to construction. Therefore, this impact is considered significant and unavoidable.

#### **Mitigation Measure CUL-4: Follow state and federal law governing human remains if such resources are discovered during construction**

Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

#### **Impact CUL-5: Direct and indirect effects on eligible and potentially eligible historic architectural/built environment-resources resulting from construction activities**

A total of thirty-seven (37) resources would be affected by this alternative, as described in Appendix 18B. These affected resources are substantially similar to the resources described in Alternative 1A; however the Hood Historic District, containing thirty-four (34) resources would not be affected. In addition, six of the significant ranches/agricultural properties and rural single-family/multiple-family properties that would be affected by Alternative 1A would not be affected by Alternative 3A; no additional significant ranches/agricultural properties and rural single-family/multiple-family properties not affected by Alternative 1A would be affected by Alternative 3A. The bridge and five accessible islands would be affected by all alternatives under the tunnel option. These built resources include previously identified resources and resources newly identified resources that appear to have significance under the CRHR and NRHP for the same reasons described for Alternative 1A. These properties also retain enough integrity to convey their historic significance because the setting and character defining features of these properties remain largely intact. The majority of these properties are located in the northern third of the alignment, near the intakes and the northern forebay.

#### **Anticipated Effects on Identified Resources**

Direct effects on identified resources associated with this alternative include demolition of these resources to place intakes, a forebay, transmission towers, tunnel muck work areas or other areas of surface impact, and concrete batch plants and fuel stations adjacent to the alignment. Direct effects may also occur through damage resulting from construction-generated vibration which can result in structural damage or foundation subsidence. Even if the resources can be avoided they may be subject to indirect effects resulting from permanent changes to the visual setting caused by construction of the nearby intakes, transmission towers 95'-100' tall, pumping plants, or tunnel muck work areas if the soil is not removed upon the completion of construction and the land restored to its original condition. These new features would cause indirect effects because new

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facilities would be inconsistent with the rural feeling, setting, and association that contributes, in part, to the significance of these built environment cultural resources. These resources and the effect mechanism (direct or indirect) are provided in Appendix 18B. Facility redesign to avoid direct impacts on historic architectural resources is preferred as mitigation if possible. However, it is unlikely that all identified resources can be avoided because of the scale of the BDCP and the need to balance avoidance of other important environmental resources such as wetlands, natural communities, and special-status species habitat. These effects would materially impair the resources within the meaning of CEQA and result in adverse effects within the meaning of Section 106 because they would diminish the characteristics that convey the significance of the resources. Direct demolition and indirect effects are likely to occur even with mitigation. Therefore, these effects would be adverse.

**CEQA Conclusion:** Thirty-seven eligible and potentially eligible historic-era built environment resources have been identified in the footprint of this alternative. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

#### **Mitigation Measure CUL-5: Implement a built environment treatment plan, consult with relevant parties, and implement treatment**

Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

#### **Impact CUL-6: Direct and indirect effects on unidentified and unevaluated historic architectural/built environment resources resulting from construction activities**

The footprint of this alternative is sensitive for unidentified and unevaluated built environment resources that may have significance and integrity for the same reasons described under Alternative 1A. A total of 35 unevaluated built environment resources have been identified that may be subject to direct or indirect effects as a result of the construction of this alternative.

#### **Anticipated Effects**

Construction may result in direct demolition of these resources, damage through vibration, or indirect effects such as changes to the setting. While mitigation is available to reduce these effects, this mitigation cannot guarantee that all effects would be avoided because mitigation cannot guarantee that eligible resources would be avoided and that adverse changes to the setting would not occur. Construction has the potential to directly or indirectly damage built environment resources through demolition or introduction of new inconsistent features into the setting. These changes would impair the ability of the resources to convey their significance because the character defining elements or setting of the resource would be lost. Therefore, impacts on these resources may be adverse.

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**CEQA Conclusion:** The BDCP area is sensitive for built environment resources that have not yet been recorded and evaluated because the majority of the BDCP area is legally inaccessible, and inventory efforts have not gathered information in these inaccessible areas. Many of these resources are likely to be associated with important historical themes or persons, or possess high creative values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of these resources remain intact and retain their rural agricultural setting they are also likely to have integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or historical resources under the NHPA and CEQA. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

**Mitigation Measure CUL-6: Conduct a survey of inaccessible properties to assess eligibility, determine if these properties will be adversely impacted by the project, and include the treatment of these properties in the mitigation plans for known properties to resolve or mitigate adverse impacts.**

Please refer to Mitigation Measure CUL-6 under Alternative 1A.

**Mitigation Measure CUL-6: Conduct a survey of inaccessible properties to assess eligibility, determine if these properties will be adversely impacted by the project, and develop treatment to resolve or mitigate adverse impacts.**

Please see Mitigation Measure CUL-6 under Alternative 1A.

#### **Impact CUL-7: Effects of conservation measures on cultural resources**

This impact describes the potential effects of other conservation measures at a program level of detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar to Impact CUL-7 as discussed under Alternative 1A because the nature of the affected resources, scope of activities, and geographic area of effects are generally similar. These measures would result in effects on cultural resources when ground-disturbing work is performed to construct improvements and enhance or restore natural communities. Direct effects would occur through demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic archaeological sites, unique archaeological sites, TCPs, human remains, and built environment resources. Indirect effects may occur where changes to the setting alter the existing setting in a manner that is inconsistent with the feeling and association of the resource. Because the ability of the resources to convey their significance would be lost this effect would materially alter these resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural landscapes that are converted to habitat may no longer convey the themes of agriculture and settlement, and thus would be inconsistent with remaining features associated with rural historic landscapes created by reclamation, cultivation, and ranching.



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Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of land included in all conservation measures that would be implemented under this alternative, it is unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique archaeological sites could be avoided. Therefore, this impact would be adverse.

**CEQA Conclusion:** Construction and implementation of conservation measures would result in ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and built environment resources such as historic architectural structures and rural historic landscapes. The same construction may damage unique archaeological sites. This construction would likely result in materially adverse changes for the following reasons:

- ground disturbing construction in archaeological sites disrupts the spatial associations that contain data useful in research, thus diminishing or destroying the basis for the significance of the resource, and;
- ground disturbing construction may either directly demolish or indirectly affect the setting of built environment resources, resulting in an inability of the resource to convey its significance, and;
- ground disturbing construction may either directly demolish or change the setting of traditional cultural properties resulting in an inability of the resource to convey its significance.
- ground disturbing construction may inadvertently disturb human remains.

The alteration of a resource that changes the characteristics that convey its significance is a material alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under CEQA under the Appendix G checklist. Because this construction would materially alter these categories of resources and disturb human remains it would result in a significant impact. Mitigation is available to reduce these impacts by identifying and evaluating resources, avoiding resources where possible, and developing treatment where avoidance is not possible. In addition construction would be monitored. However, because of the acreage associated with the proposed restoration under conservation measures, as well as the multiple constraints associated with other environmental resources that require mitigation or avoidance, it is unlikely that all cultural resources could be avoided. Therefore, this impact remains significant and unavoidable.

#### **Mitigation Measure CUL-7: Conduct cultural resource studies and adopt cultural resource mitigation measures for cultural resource impacts associated with conservation component implementation**

Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A.

#### **Impact CUL-8: Compatibility of the proposed water conveyance facilities and other conservation measures with plans and policies**

Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could result in the potential for incompatibilities with plans and policies adopted to protect the cultural resources of the Delta. A number of plans and policies that coincide with the study area provide guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether

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Alternative 3 is compatible or incompatible with these policies, rather than whether impacts are adverse or not adverse or significant or less than significant. Because Alternative 3 would result in the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the BDCP will be compatible with these policies because significant cultural resources will be avoided where feasible, and mitigation will be implemented to reduce effects where avoidance and preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

**CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by the various counties with jurisdiction in this region. For policies that emphasize preservation or mitigation the BDCP will be compatible with these policies because DWR and Reclamation will implement cultural resource management practices that will identify significant resources, preserve such resources where feasible, and complete mitigation to reduce significant effects where preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

### 18.3.5.9 Alternative 4—Dual Conveyance with Pipeline/Tunnel and Intakes 2, 3, and 5 (9,000 cfs; Operational Scenario H)

#### Impact CUL-1: Effects on identified archaeological sites resulting from construction of conveyance facilities

##### Identified Resources

Record searches at the CHRIS and inventory efforts have identified the following previously recorded prehistoric archaeological sites in the footprint of this alternative: CA-Sac-56, CA-Sac-57, CA-Sac-59, CA-Sac-65/H, and CA-Sac-328. The affected resources are identical to the resources described above under Alternative 1A. Record searches also identified on historic archaeological site, CA-SJO-220H, in the footprint of this alternative. Detailed site descriptions summarizing available information regarding these resources, are provided in Appendix 18B. Collectively, these six previously recorded resources represent the known resources that occur in the footprint of this alternative.

##### Significance of Identified Prehistoric and Historic Resources

Many of the directly affected sites are midden sites, with debris and artifacts associated with prehistoric habitation and residence activities. Midden sites in the Plan Area are often colloquially referred to as “mound sites” because they often form low mounds elevated relative to the surrounding landform. While the original raised deposit has sometimes been destroyed, midden

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sites often have substantial deposits below the original raised landform that remain intact that typically contain the material remains associated with prehistoric habitation. This organic debris can be used for radiocarbon dating, as well as material that reveals the nature of subsistence activities pursued by prehistoric populations. Because there is no single unified prehistoric chronology for the Delta region, substantial research questions remain unresolved regarding nature and changes of subsistence and settlement activity over the span of the prehistoric occupation of the Delta. The Delta is the prehistoric point of articulation between Central Valley cultures and the aboriginal people that occupied the San Francisco Bay area. Because the cultural chronology and sources of cultural change for the Delta remain unresolved in part, sites in the footprint of this alternative likely contain information that could help clarify these research issues. For this reason these resources are likely significance under the fourth criterion for the CRHR and NRHP.

Two of the identified sites contain human burials, as described on the site records (CA-Sac-328 and CA-Sac-56). Most if not all of the remaining sites are likely to contain additional burials because midden sites in the Plan Area typically contain human burials or cremations. Burial components within these sites often contain ornaments and other personal items such as charmstones, beads, and other decorative material. Because the style and form of these artifacts change throughout prehistory, and because these stylistic changes have been defined, these materials provide a method of associating archaeological material with specific prehistoric time periods. The ability to associate habitation remains with specific time periods is one of the most significant problems in prehistoric research, because the sequence of specific adaptations and behaviors only becomes clear when a chronology can be constructed that associates behavior and material culture with specific time frames. For this reason these resources are likely significance under the fourth criterion for the CRHR and NRHP.

The single historic-era archaeological resource, CA-SJo-220H, consists of a trash scatter and set of standing structures associated with George Shima and his agricultural work camps. Because this site is the associated with an important economic theme of the reclamation and agricultural development of the delta, it may contain data useful in historic research. Available information such as the site record suggests that the resource is largely undisturbed and is likely to contain sufficient integrity to convey this significance. For these reasons it likely qualifies as an historical resource under CEQA and a historic property under the NRHP.

Because many of these resources are expansive (each in excess of 30 meters across), they are each likely to contain some portion of the deposit with sufficient integrity to yield artifacts in their original associations in a manner that will convey these significance themes. Therefore these identified resources are likely to qualify as historical resources under CEQA. For the same reasons, these resources are likely to qualify as historic properties under the NRHP.

#### **Anticipated Effects on Identified Resources**

The exact location of these resources cannot be disclosed because such disclosure might allow looters to find the sites on the ground and remove archaeological material. However, these resources occur within the footprint of both temporary work areas and permanent surface impacts. The resources are distributed evenly across the alignment, but are somewhat clustered where construction of large above-ground features would occur, such as the northern end of the alignment, at the intermediate forebay, and at the southern end of the alignment. Ground-disturbing construction is likely to disturb the deposits and thus materially their ability to convey their significance. Much of the data potential in archaeological resources exists in the spatial associations

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of different artifacts and other cultural material. Where artifacts that have known associations with particular time periods occur adjacent to other material such as faunal bone or plant remains from subsistence activity, the proximity of the materials allows an inference as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence strategies during different prehistoric periods. Intrusive ground-disturbing construction may disrupt these associations and thus disrupt the qualities for which the sites qualify as historical resources. For these reasons, construction has the potential to materially impair these resources under CEQA and to adversely affect the resources as defined by Section 106 of the NHPA. This effect would be adverse.

**CEQA Conclusion:** Construction of conveyance facilities would affect identified archaeological resources that occur in the footprint of this alternative. DWR has evaluated these resources and finds they are likely to qualify as historical resources under CEQA, as described in detail in Appendix 18B. This impact would be significant because construction could materially alter or destroy the potential of these resources to yield information useful in archaeological research, the basis for the significance of these resources, through excavation and disruption of the spatial associations that contain meaningful information. Mitigation Measure CUL-1a would reduce this impact, but would not guarantee that all of the scientifically important material would be retrieved because feasible archaeological excavation only typically retrieves a sample of the deposit, and portions of the site may remain after treatment with important information. Construction could damage these remaining portions of the deposit. Therefore, this impact is significant and unavoidable.

**Mitigation Measure CUL-1: Prepare a data recovery plan and perform data recovery excavations on the affected portion of the deposits of identified and significant archaeological sites**

Please see Mitigation Measure CUL-1 under Alternative 1A.

**Impact CUL-2: Effects on archaeological sites to be identified through future inventory efforts**

An inventory for the majority of the right-of-way for this alternative has not been conducted because the right-of-way is not currently legally accessible (Appendix 4A). Because several prehistoric archaeological sites qualifying as historical resources have been identified in the footprint of this alternative, the remaining portion of the right-of-way for this conveyance feature is sensitive for previously unidentified archaeological resources. Record searches at the North Central Information Center reviewed the mapped location of previous cultural resource inventories in the footprint of this alternative and the vicinity. This map review revealed that a cultural resources inventory has never been conducted in the majority of the footprint for alternative. The presence of three archaeological sites that qualify as historical resources and historic properties in the portion of the footprint that has been previously inspected provides a sample of the likely density and occurrence of resources in the remaining right-of-way. For this reason, additional prehistoric archaeological resources are likely to be found in the portion of the right-of-way where surveys have not been conducted, once access is available and such studies can be completed.

In addition to prehistoric archaeological resources, the BDCP area is sensitive for historic-era archaeological resources. While record searches revealed no recorded historic-era archaeological resources in the right-of-way, it is likely that previously unidentified historic archaeological sites occur in the footprint of this alternative because of the intensity of human activity in the Plan Area during the historic era, as described in Section 18.1.6, *Historic-Era Setting*.

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Prehistoric sites in the Plan Area tend to be large and rich in material remains, including human burials and associated ornaments and beads. Habitation debris also often contains both floral and faunal material that can be used for both radiocarbon dating and analysis regarding subsistence strategies. In addition, the large scale of typical prehistoric archaeological resources suggests portions of these deposits will remain with sufficient integrity to convey research information. Therefore, these sites are likely to qualify as historical resources or unique archaeological resources under CEQA and historic properties under Section 106 of the NHPA.

Historic sites are likely to be associated with the historic-era themes of settlement, reclamation, agriculture, and flood management in the Delta region. Because the reclamation and agricultural development of the Delta region provided part of the economic base for the development of surrounding urban centers, these historic themes are significant at both a state and national level. These resources accordingly may contain data useful in historical research. In addition, the intensity of historic activity in the Delta region suggests that many of these resources are likely to be distributed across the footprint of this alternative and some are likely to retain sufficient integrity to convey this significance if they are subject to archaeological excavation and investigation. Therefore, these sites are likely to qualify as historical resources or unique archaeological resources under CEQA and historic properties under Section 106 of the NHPA.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. The locations of various features such as intakes, forebays, and tunnels shaft locations are depicted in Figure M3-1 in the mapbook volume. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA. These effects would be adverse.

**CEQA Conclusion:** The right-of-way for this alternative is sensitive for both prehistoric and historic-era resources that cannot be identified at this time because the much of the right-of-way is not legally accessible. Because many of these resources are likely to have data useful in prehistoric and historic archaeological research, as well as the integrity to convey this significance, they are likely to qualify as historical resources or unique archaeological sites under CEQA or historic properties under the Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of these resources by disrupting the spatial associations that could yield important data, resulting in a significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot guarantee that all eligible or significant resources would be preserved in place, or that all important data would be retrieved before construction destroys these resources. The scale of the BDCP, investment into existing designs, and the presence of other important environmental resources such as habitat, natural communities, and wetlands that should be avoided are constraints on the flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

#### **Mitigation Measure CUL-2: Conduct inventory, evaluation, and treatment of archaeological resources**

Please refer to Mitigation Measure CUL-2, above, under Alternative 1A.

### **Impact CUL-3: Effects on archaeological sites that may not be identified through inventory efforts**

Because several archaeological sites qualifying as historical resources have been identified in the footprint of this alternative, the remaining portion of the right-of-way for this conveyance feature is sensitive for previously unidentified prehistoric archaeological resources. While surveys will be completed for the right-of-way, once access is available, such surveys cannot guarantee that all sites will be identified prior to construction. The rapid rate of at which alluvium and sediment accumulates in the Delta region, and the geologically unstable nature of the floodplain and riverbank environments in which these resources may occur makes it likely that numerous sites occur capped below surface soils. Cultural resource inventory efforts cannot always identify such resources, even with intermittent surface excavation designed to reveal sites with little or no surface manifestation because exhaustive sampling to identify every resource is economically and technically infeasible. These sites may also occur buried at the depth at which tunnel boring operations would be performed.

Many of these unidentified prehistoric resources are likely to qualify as historical resources, historic properties, or unique archaeological resources because prehistoric sites in the Delta region tend to be large and contain a rich material culture. In particular, burial features tend to be associated with numerous shell ornaments, charmstones, and associated grave goods. Habitation components often contain abundant faunal and floral remains that elucidate prehistoric adaptations such as subsistence methods.

In addition to prehistoric archaeological resources, the BDCP area is sensitive for historic-era archaeological resources. Archaeological debris found in historic era archaeological sites activity is likely to be associated with significant themes such as agriculture, reclamation, and settlement of the Delta region. The size of the BDCP area and the intensity of historic activity suggest that some of these resources will qualify as historical resources, historic properties, or unique archaeological resources.

Ground disturbing work, including the construction of surface features such as intakes, and the subterranean tunnel boring operations and shafts may disturb and damage these resources before they can be identified and avoided during monitoring efforts required under Mitigation Measure CUL-3. This damage and disturbance may materially impair these resources within the meaning of CEQA or adversely affect the resources within the meaning of Section 106 because this disturbance would impair the ability of these resources to yield data useful in research. While Mitigation Measure CUL-3 would reduce the potential for this impact, it would not guarantee the impact would be avoided entirely. Therefore, this impact is adverse.

**CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb previously unidentified archaeological sites qualifying as historical resources, historic properties, or unique archaeological resources. Because direct excavation, compaction, or other disturbance may disrupt the spatial associations that contain scientifically useful information it would alter the potential basis for eligibility, thus materially altering the resource and resulting in a significant effect. Because these resources would not be identified prior to construction, they cannot be recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-3 would reduce but not entirely avoid the potential for this impact, by implementing construction worker training, monitoring and discovery protocols. However, because archaeological resources may not be identified prior to disturbance through these measures, the effect cannot be entirely avoided. Therefore, this impact would remain significant and unavoidable.

**Mitigation Measure CUL-3: Implement an archaeological resources discovery plan, perform training of construction workers, and conduct construction monitoring**

Please refer to Mitigation Measure CUL-3, above, for Alternative 1A.

**Impact CUL-4: Effects on buried human remains damaged during construction**

The footprint of this alternative is sensitive for buried human remains that may occur in isolation, rather than as part of prehistoric or historic archaeological sites. Historic and prehistoric human remains have been discovered as isolated interments rather than as part of larger sites. Because these isolated resources are not associated with larger deposits, their distribution and depth cannot be estimated. Construction of this alternative would require ground disturbing work that may damage previously unidentified human remains, resulting in direct effects on these resources. While inventory and monitoring efforts are prescribed above under Mitigation Measures CUL-2 and CUL-3, the large acreages subject to disturbance under this alternative make exhaustive sampling to identify all buried and isolated human remains technically and economically infeasible. For these reasons the potential remains that such resources may be damaged before they can be discovered through inventory or monitoring. This effect would be adverse.

**CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human remains. Construction would likely result in disturbance of these features. Disturbance of human remains, including remains interred outside of cemeteries is considered a significant impact in the CEQA Appendix G checklist, therefore disturbance of these remains would result in a significant effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-significant level because mitigation would not guarantee that these features could be discovered and treated in advance of construction; the scale of construction makes it technically and economically infeasible to perform the level of sampling necessary to identify all such resources prior to construction. Therefore, this impact is considered significant and unavoidable.

**Mitigation Measure CUL-4: Follow state and federal law governing human remains if such resources are discovered during construction**

Please refer to Mitigation Measure CUL-4, above, for Alternative 1A.

**Impact CUL-5: Direct and indirect effects on eligible and potentially eligible historic architectural/built environment-resources resulting from construction activities**

A total of thirty-one (31) built environment resources would be affected by this alternative. A table of these historically significant properties, their attributes, and whether or not the impacts are direct or indirect can be found in Appendix 18B. An option under consideration for this alternative includes a power transmission corridor originating in Holt, California and extending to the project area. The majority of this potential transmission line follows a public road that has existing power poles. The transmission line then enters a largely undeveloped area. If this east/west alignment necessitates the addition of taller or more massive poles or towers along the public road, it may cause an adverse indirect visual impact to historic resources in the area.

These affected resources are substantially similar to the resources described in Alternative 1A, however the Hood Historic District, containing thirty-four (34) resources would not be affected. In addition, fourteen of the significant ranches/agricultural properties and rural single-family/multiple-family properties that would be affected by Alternative 1A would not be affected by Alternative 4;

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one additional significant ranch/agricultural property or rural single-family/multiple-family property not affected by Alternative 1A would be affected by Alternative 4. The bridge and five accessible islands would be affected by all alternatives under the tunnel option.

The following summary discusses the basis for potential eligibility as well as the nature of potential effects for these resources. Many potentially eligible resources are significant under the first NRHP and CRHR criterion because of their association with events that have made a significant contribution to the development of the Delta. Individual significance themes that are relevant to broad patterns of history and heritage include:

- land reclamation and flood management structures;
- early settlement represented by residences and communities, including concentrated settlement of ethnic groups, such as Chinese, Japanese, Filipino, and Portuguese;
- early settlement that represents a town's growth as the commercial or manufacturing/processing focus of the surrounding agricultural area;
- early produce processing plants;
- early agricultural properties that may include a residence or multiple residences, barns, worker housing, ancillary buildings, planted acreage and associated irrigation systems; and;
- transportation infrastructure such as bridges, ferries, roads and trains, that enabled produce to get to market.

The following is a summary of properties within this alternative considered eligible under this criterion.

- This alternative crosses twelve islands or reclamation districts, five of which are accessible/partially accessible. Only the accessible islands are included in the count of affected resources. The inaccessible islands are included in the count of inaccessible, likely affected resources (see Impact CUL-6 and appendix 18B). The majority of these islands were established in the late 19th century. While associated water-control features, such as the levees, weirs, pumps and pump houses have been necessarily updated and maintained, the integrity of land use on these islands is high and has changed little since they were established. All of these islands would be directly affected by this alternative. These properties are also significant under the third criterion for the NRHP and CRHR for their engineering characteristics.
- Eighteen significant ranches/agricultural properties and rural single-family/multiple-family properties will be either directly or indirectly impacted.

For the large ranch/agricultural properties, this alternative avoids many of the buildings associated with these properties, impacting only the agricultural land. This is still considered a direct impact because the agricultural land is a character-defining feature of this kind of property. Indirect affects occur when the alternative impacts adjacent property, diminishing historic integrity of the eligible property by altering its visual setting, feeling, and association. Properties under which the tunnel will be passing will not likely be demolished, however impacts from settlement or vibration may occur.

Rural single-family and multiple-family properties are made up of Delta-style houses, other rural homes at least 45 years old, and grand river-front homes. Again, as with the ranches/agricultural properties, these homes will be either directly impacted by this alternative



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or indirectly impacted by alteration of the setting, which is a character-defining feature of this kind of resource.

- One bridge, the Bacon Island Railroad swing bridge, will be directly impacted by the addition of a shaft.

Seven significant ranches/agricultural properties and rural single-family/multiple-family properties will be either directly or indirectly impacted. These resources are significant because they embody characteristics and distinctive design characteristics (the third criterion for the NRHP and CRHR). Such design characteristics include elements found specifically in the Delta, such as 19<sup>th</sup>-century/early 20<sup>th</sup>-century Delta-style houses built with the main entrance on the second floor in response to historically frequent flooding. Other properties include agricultural residences or landscapes with distinctive landscaping and barns.

For the large ranch/agricultural properties, this alternative avoids many of the buildings associated with these properties, impacting only the agricultural land. This is still considered a direct impact because the agricultural land is a character-defining feature of this kind of property. Indirect effects occur when the alternative impacts adjacent property, diminishing historic integrity of the eligible property by altering its visual setting, feeling, and association. Properties under which the tunnel will be passing will not likely be impacted, however impacts from settlement or vibration may result in indirect effects.

Rural single-family and multiple-family properties are made up of Delta-style houses, other rural homes at least 45 years old, and grand river-front homes.

#### Anticipated Effects on Identified Resources

Direct effects on identified resources associated with this alternative include demolition of these resources to place intakes, a forebay, transmission lines, poles and towers, tunnel muck work areas, and concrete batch plants and fuel stations adjacent to the alignment. Direct effects may also occur through damage resulting from construction-generated vibration which can result in structural damage or foundation subsidence. Even if the resources can be avoided they may be subject to indirect effects resulting from permanent changes to the visual setting caused by construction of the nearby intakes, transmission lines, pumping plants, or tunnel muck work areas if the soil is not removed upon the completion of construction and the land restored to its original condition. These new features would cause indirect effects because new facilities would be inconsistent with the rural feeling, setting, and association that contributes, in part, to the significance of these built environment cultural resources. These resources and the effect mechanism (direct or indirect) are provided in Appendix 18B. Facility redesign to avoid direct impacts on historic architectural resources is preferred as mitigation if possible. However, it is unlikely that all identified resources can be avoided because of the scale of the BDCP and the need to balance avoidance of other important environmental resources such as wetlands, natural communities, and special-status species habitat. These effects would materially impair the resources within the meaning of CEQA and result in adverse effects within the meaning of Section 106 because they would diminish the characteristics that convey the significance of the resources. Direct demolition and indirect effects are likely to occur even with mitigation. Therefore, these effects would be adverse.

**CEQA Conclusion:** Thirty one eligible and potentially eligible historic-era built environment resources have been identified in the footprint of this alternative. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also

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result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

#### **Mitigation Measure CUL-5: Implement a built environment treatment plan, consult with relevant parties, and implement treatment**

Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

#### **Impact CUL-6: Direct and indirect effects on unidentified and unevaluated historic architectural/built environment resources resulting from construction activities**

The footprint of this alternative is sensitive for unidentified and unevaluated built environment resources that may have significance and integrity for the same reasons described under Alternative 1A. A total of 36 unevaluated built environment resources have been identified that may be subject to direct or indirect effects as a result of the construction of this alternative.

#### **Anticipated Effects**

Construction may result in direct demolition of these resources, damage through vibration, or indirect effects such as changes to the setting. While mitigation is available to reduce these effects, this mitigation cannot guarantee that all effects would be avoided because mitigation cannot guarantee that eligible resources would be avoided and that adverse changes to the setting would not occur. Construction has the potential to directly or indirectly damage built environment resources through demolition or introduction of new inconsistent features into the setting. These changes would impair the ability of the resources to convey their significance because the character defining elements or setting of the resource would be lost. Therefore, impacts on these resources may be adverse.

**CEQA Conclusion:** The BDCP area is sensitive for built environment resources that have not yet been recorded and evaluated because the majority of the BDCP area is legally inaccessible, and inventory efforts have not gathered information in these inaccessible areas. Many of these resources are likely to be associated with important historical themes or persons, or possess high creative values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of these resources remain intact and retain their rural agricultural setting they are also likely to have integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or historical resources under the NHPA and CEQA. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this

impact remains significant and unavoidable even with implementation of the following mitigation measures.

**Mitigation Measure CUL-6: Conduct a survey of inaccessible properties to assess eligibility, determine if these properties will be adversely impacted by the project, and include the treatment of these properties in the mitigation plans for known properties to resolve or mitigate adverse impacts.**

Please refer to Mitigation Measure CUL-6 under Alternative 1A.

### **Impact CUL-7: Effects of conservation measures on cultural resources**

This impact describes the potential effects of other conservation measures at a program level of detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar to Impact CUL-7 as discussed under Alternative 1A because the nature of the affected resources, scope of activities, and geographic area of effects are generally similar. These measures would result in effects on cultural resources when ground-disturbing work is performed to construct improvements and enhance or restore natural communities. Direct effects would occur through demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic archaeological sites, unique archaeological sites, TCPs, human remains, and built environment resources. Indirect effects may occur where changes to the setting alter the existing setting in a manner that is inconsistent with the feeling and association of the resource. Because the ability of the resources to convey their significance would be lost this effect would materially alter these resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural landscapes that are converted to habitat may no longer convey the themes of agriculture and settlement, and thus would be inconsistent with remaining features associated with rural historic landscapes created by reclamation, cultivation, and ranching.

Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of land included in all conservation measures that would be implemented under this alternative, it is unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique archaeological sites could be avoided. Therefore, this impact would be adverse.

**CEQA Conclusion:** Construction and implementation of conservation measures would result in ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and built environment resources such as historic architectural structures and rural historic landscapes. The same construction may damage unique archaeological sites. This construction would likely result in materially adverse changes for the following reasons:

- ground disturbing construction in archaeological sites disrupts the spatial associations that contain data useful in research, thus diminishing or destroying the basis for the significance of the resource, and;
- ground disturbing construction may either directly demolish or indirectly affect the setting of built environment resources, resulting in an inability of the resource to convey its significance, and;
- ground disturbing construction may either directly demolish or change the setting of traditional cultural properties resulting in an inability of the resource to convey its significance.

- ground disturbing construction may inadvertently disturb human remains.

The alteration of a resource that changes the characteristics that convey its significance is a material alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under CEQA under the Appendix G checklist. Because this construction would materially alter these categories of resources and disturb human remains it would result in a significant impact. Mitigation is available to reduce these impacts by identifying and evaluating resources, avoiding resources where possible, and developing treatment where avoidance is not possible. In addition construction would be monitored. However, because of the acreage associated with the proposed restoration under conservation measures, as well as the multiple constraints associated with other environmental resources that require mitigation or avoidance, it is unlikely that all cultural resources could be avoided. Therefore, this impact remains significant and unavoidable.

**Mitigation Measure CUL-7: Conduct cultural resource studies and adopt cultural resource mitigation measures for cultural resource impacts associated with conservation component implementation**

Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A

**Impact CUL-8: Compatibility of the proposed water conveyance facilities and other conservation measures with plans and policies**

Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could result in the potential for incompatibilities with plans and policies adopted to protect the cultural resources of the Delta. A number of plans and policies that coincide with the study area provide guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether Alternative 4 is compatible or incompatible with these policies, rather than whether impacts are adverse or not adverse or significant or less than significant. Because Alternative 4 would result in the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the BDCP will be compatible with these policies because significant cultural resources will be avoided where feasible, and mitigation will be implemented to reduce effects where avoidance and preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

**CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by the various counties with jurisdiction in this region. For policies that emphasize preservation or mitigation the BDCP will be compatible with these policies because DWR and Reclamation will implement cultural resource management practices that will identify significant resources, preserve such resources where feasible, and complete mitigation to reduce significant effects where preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section

13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

### **18.3.5.10 Alternative 5—Dual Conveyance with Pipeline/Tunnel and Intake 1 (3,000 cfs; Operational Scenario C)**

#### **Impact CUL-1: Effects on identified archaeological sites resulting from construction of conveyance facilities**

##### **Identified Resources**

Record searches at the CHRIS and inventory efforts have identified previously recorded prehistoric archaeological sites in the footprint of this alternative: CA-Sac-57, CA-Sac-59, and CA-Sac-65/H. Record searches also identified an historic archaeological site, CA-SJO-220H, in the footprint of this alternative. Detailed site descriptions summarizing available information regarding these resources, are provided in Appendix 18B.

The resources are distributed evenly across the alignment, but are somewhat clustered where construction of large above-ground features would occur, such as the northern end of the alignment, at the intermediate forebay, and at the southern end of the alignment.

##### **Significance of Identified Prehistoric and Historic Resources**

The resources affected by this alternative have likely have significance and integrity within the meaning of the NRHP and CRHR for the same reasons described above under Alternative 1A.

##### **Anticipated Effects on Identified Resources**

Ground-disturbing construction is likely to disturb the deposits and thus materially their ability to convey their significance. Much of the data potential in archaeological resources exists in the spatial associations of different artifacts and other cultural material. Where artifacts that have known associations with particular time periods occur adjacent to other material such as faunal bone or plant remains from subsistence activity, the proximity of the materials allows an inference as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence strategies during different prehistoric periods. Intrusive ground-disturbing construction may disrupt these associations and thus disrupt the qualities for which the sites qualify as historical resources. For these reasons, construction has the potential to materially impair these resources under CEQA and to adversely affect the resources as defined by Section 106 of the NHPA. This effect would be adverse.

**CEQA Conclusion:** Construction of conveyance facilities would affect identified archaeological resources that occur in the footprint of this alternative. DWR has evaluated these resources and finds they are likely to qualify as historical resources under CEQA, as described in detail in Appendix 18B. This impact would be significant because construction could materially alter or destroy the potential of these resources to yield information useful in archaeological research, the basis for the significance of these resources, through excavation and disruption of the spatial associations that contain meaningful information. Mitigation Measure CUL-1a would reduce this impact, but would not guarantee that all of the scientifically important material would be retrieved because feasible

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archaeological excavation only typically retrieves a sample of the deposit, and portions of the site may remain after treatment with important information. Construction could damage these remaining portions of the deposit. Therefore, this impact is significant and unavoidable.

#### **Mitigation Measure CUL-1: Prepare a data recovery plan and perform data recovery excavations on the affected portion of the deposits of identified and significant archaeological sites**

Please refer to Mitigation Measure CUL-1 under Alternative 1A.

#### **Impact CUL-2: Effects on archaeological sites to be identified through future inventory efforts**

This impact is substantially similar to Impact CUL-2 described under Alternative 1A. While only one intake would be constructed, slightly reducing the footprint, the overall potential for effects on archaeological resources is similar.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. The locations of various features such as intakes, forebays, and tunnels shaft locations are depicted in Figure M3-1 in the mapbook volume. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of these resources to yield data useful in research. While Mitigation Measure CUL-2 would reduce these effects, it cannot guarantee all effects would be avoided because relocation of proposed facilities to avoid all resources is unlikely. These effects would remain adverse.

**CEQA Conclusion:** The right-of-way for this alternative is sensitive for both prehistoric and historic-era resources that cannot be identified at this time because the much of the right-of-way is not legally accessible. Because many of these resources are likely to have data useful in prehistoric and historic archaeological research, as well as the integrity to convey this significance, they are likely to qualify as historical resources or unique archaeological sites under CEQA or historic properties under the Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of these resources by disrupting the spatial associations that could yield important data, resulting in a significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot guarantee that all eligible or significant resources would be preserved in place, or that all important data would be retrieved before construction destroys these resources. The scale of the BDCP, investment into existing designs, and the presence of other important environmental resources such as habitat, natural communities, and wetlands that should be avoided are constraints on the flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

#### **Mitigation Measure CUL-2: Conduct inventory, evaluation, and treatment of archaeological resources**

Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

### **Impact CUL-3: Effects on archaeological sites that may not be identified through inventory efforts**

This impact is substantially similar to Impact CUL-3 described under Alternative 1A. While only one intake would be constructed, slightly reducing the footprint, the overall potential for effects on unidentified archaeological resources is similar.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of these resources to yield data useful in research. Mitigation Measure CUL-3 would reduce these effects, but cannot guarantee that all effects would be avoided because inadvertent disturbance of some resources is inevitable given the scale of the proposed construction. These effects would therefore remain adverse.

**CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb previously unidentified archaeological sites qualifying as historical resources, historic properties, or unique archaeological resources. Because direct excavation, compaction, or other disturbance may disrupt the spatial associations that contain scientifically useful information it would alter the potential basis for eligibility, thus materially altering the resource and resulting in a significant effect. Because these resources would not be identified prior to construction, they cannot be recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-3 would reduce but not entirely avoid the potential for this impact, by implementing construction worker training, monitoring and discovery protocols. However, because archaeological resources may not be identified prior to disturbance through these measures, the effect cannot be entirely avoided. Therefore, this impact would remain significant and unavoidable.

#### **Mitigation Measure CUL-3: Implement an archaeological resources discovery plan, perform training of construction workers, and conduct construction monitoring**

Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

### **Impact CUL-4: Effects on buried human remains damaged during construction**

The footprint of this alternative is sensitive for buried human remains that may occur in isolation, rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact mechanisms are substantially similar to the sensitivity and impact mechanisms described under Alternative 1A. While only one intake would be constructed, slightly reducing the footprint, the overall potential for effects on buried human remains is similar.

Ground disturbing construction has the potential to damage and disinter buried human remains, resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect remains adverse.

**CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human remains. Construction would likely result in disturbance of these features. Disturbance of human remains, including remains interred outside of cemeteries is considered a significant impact in the

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CEQA Appendix G checklist, therefore disturbance of these remains would result in a significant effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-significant level because mitigation would not guarantee that these features could be discovered and treated in advance of construction; the scale of construction makes it technically and economically infeasible to perform the level of sampling necessary to identify all such resources prior to construction. Therefore, this impact is considered significant and unavoidable.

#### **Mitigation Measure CUL-4: Follow state and federal law governing human remains if such resources are discovered during construction**

Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

#### **Impact CUL-5: Direct and indirect effects on eligible and potentially eligible historic architectural/built environment-resources resulting from construction activities**

A total of thirty-six (36) built environment resources would be affected by this alternative. A table of these historically significant properties, their attributes, and whether or not the impacts are direct or indirect can be found in Appendix 18B. These affected resources are substantially similar to the resources described in Alternative 1A; however the Hood Historic District, containing thirty-four (34) resources would not be affected. In addition, four of the significant ranches/agricultural properties and rural single-family/multiple-family properties that would be affected by Alternative 1A would not be affected by Alternative 5; no additional significant ranches/agricultural properties and rural single-family/multiple-family properties not affected by Alternative 1A would be affected by Alternative 5. The bridge and five accessible islands would be affected by all alternatives under the tunnel option. These built resources include previously identified resources and resources newly determined to appear to have significance under the NRHP and CRHR for the same reasons described under Alternative 1A. These properties also retain enough integrity to convey their historic significance because the setting and character defining elements of these features remain largely intact. The majority of these properties are located in the northern third of the alignment, near the intakes and the northern forebay.

#### **Anticipated Effects on Identified Resources**

Direct effects on identified resources associated with this alternative include demolition of these resources to place intakes, a forebay, transmission lines, tunnel muck work areas, and concrete batch plants and fuel stations adjacent to the alignment. Direct effects may also occur through damage resulting from construction-generated vibration which can result in structural damage or foundation subsidence. Even if the resources can be avoided they may be subject to indirect effects resulting from permanent changes to the visual setting caused by construction of the nearby intakes, pumping plants, or tunnel muck work areas if the soil is not removed upon the completion of construction and the land restored to its original condition. These new features would cause indirect effects because new facilities would be inconsistent with the rural feeling, setting, and association that contributes, in part, to the significance of these built environment cultural resources. These resources and the effect mechanism (direct or indirect) are provided in Appendix 18B. Facility redesign to avoid direct impacts on historic architectural resources is preferred as mitigation if possible. However, it is unlikely that all identified resources can be avoided because of the scale of the BDCP and the need to balance avoidance of other important environmental resources such as wetlands, natural communities, and special-status species habitat. These effects would materially impair the resources within the meaning of CEQA and result in adverse effects within the meaning of



Section 106 because they would diminish the characteristics that convey the significance of the resources. Direct demolition and indirect effects are likely to occur even with mitigation. Therefore, these effects would be adverse.

**CEQA Conclusion:** Thirty-six eligible and potentially eligible historic-era built environment resources have been identified in the footprint of this alternative. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

**Mitigation Measure CUL-5: Implement a built environment treatment plan, consult with relevant parties, and implement treatment**

Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A

**Impact CUL-6: Direct and indirect effects on unidentified and unevaluated historic architectural/built environment resources resulting from construction activities**

The footprint of this alternative is sensitive for unidentified and unevaluated built environment resources that may have significance and integrity for the same reasons described under Alternative 1A. A total of 33 unevaluated built environment resources have been identified that may be subject to direct or indirect effects as a result of the construction of this alternative.

**Anticipated Effects**

Construction may result in direct demolition of these resources, damage through vibration, or indirect effects such as changes to the setting. While mitigation is available to reduce these effects, this mitigation cannot guarantee that all effects would be avoided because mitigation cannot guarantee that eligible resources would be avoided and that adverse changes to the setting would not occur. Construction has the potential to directly or indirectly damage built environment resources through demolition or introduction of new inconsistent features into the setting. These changes would impair the ability of the resources to convey their significance because the character defining elements or setting of the resource would be lost. Therefore, impacts on these resources may be adverse.

**CEQA Conclusion:** The BDCP area is sensitive for built environment resources that have not yet been recorded and evaluated because the majority of the BDCP area is legally inaccessible, and inventory efforts have not gathered information in these inaccessible areas. Many of these resources are likely to be associated with important historical themes or persons, or possess high creative values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of these resources remain intact and retain their rural agricultural setting they are also likely to have integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or historical resources under the NHPA and CEQA. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent

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indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

**Mitigation Measure CUL-6: Conduct a survey of inaccessible properties to assess eligibility, determine if these properties will be adversely impacted by the project, and include the treatment of these properties in the mitigation plans for known properties to resolve or mitigate adverse impacts.**

Please refer to Mitigation Measure CUL-6 under Alternative 1A.

#### **Impact CUL-7: Effects of conservation measures on cultural resources**

This impact describes the potential effects of other conservation measures at a program level of detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar to Impact CUL-7 as discussed under Alternative 1A because the nature of the affected resources, scope of activities, and geographic area of effects are generally similar. These measures would result in effects on cultural resources when ground-disturbing work is performed to construct improvements and enhance or restore natural communities. Direct effects would occur through demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic archaeological sites, unique archaeological sites, TCPs, human remains, and built environment resources. Indirect effects may occur where changes to the setting alter the existing setting in a manner that is inconsistent with the feeling and association of the resource. Because the ability of the resources to convey their significance would be lost this effect would materially alter these resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural landscapes that are converted to habitat may no longer convey the themes of agriculture and settlement, and thus would be inconsistent with remaining features associated with rural historic landscapes created by reclamation, cultivation, and ranching.

Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of land included in all conservation measures that would be implemented under this alternative, it is unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique archaeological sites could be avoided. Therefore, this impact would be adverse.

**CEQA Conclusion:** Construction and implementation of conservation measures would result in ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and built environment resources such as historic architectural structures and rural historic landscapes. The same construction may damage unique archaeological sites. This construction would likely result in materially adverse changes for the following reasons:

- ground disturbing construction in archaeological sites disrupts the spatial associations that contain data useful in research, thus diminishing or destroying the basis for the significance of the resource, and;

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- ground disturbing construction may either directly demolish or indirectly affect the setting of built environment resources, resulting in an inability of the resource to convey its significance, and;
- ground disturbing construction may either directly demolish or change the setting of traditional cultural properties resulting in an inability of the resource to convey its significance.
- ground disturbing construction may inadvertently disturb human remains.

The alteration of a resource that changes the characteristics that convey its significance is a material alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under CEQA under the Appendix G checklist. Because this construction would materially alter these categories of resources and disturb human remains it would result in a significant impact. Mitigation is available to reduce these impacts by identifying and evaluating resources, avoiding resources where possible, and developing treatment where avoidance is not possible. In addition construction would be monitored. However, because of the acreage associated with the proposed restoration under conservation measures, as well as the multiple constraints associated with other environmental resources that require mitigation or avoidance, it is unlikely that all cultural resources could be avoided. Therefore, this impact remains significant and unavoidable.

#### **Mitigation Measure CUL-7: Conduct cultural resource studies and adopt cultural resource mitigation measures for cultural resource impacts associated with conservation component implementation**

Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A

#### **Impact CUL-8: Compatibility of the proposed water conveyance facilities and other conservation measures with plans and policies**

Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could result in the potential for incompatibilities with plans and policies adopted to protect the cultural resources of the Delta. A number of plans and policies that coincide with the study area provide guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether Alternative 5 is compatible or incompatible with these policies, rather than whether impacts are adverse or not adverse or significant or less than significant. Because Alternative 5 would result in the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the BDCP will be compatible with these policies because significant cultural resources will be avoided where feasible, and mitigation will be implemented to reduce effects where avoidance and preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

**CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by the various counties with jurisdiction in this region. For policies that emphasize preservation or

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mitigation the BDCP will be compatible with these policies because DWR and Reclamation will implement cultural resource management practices that will identify significant resources, preserve such resources where feasible, and complete mitigation to reduce significant effects where preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

### **18.3.5.11 Alternative 6A—Isolated Conveyance with Pipeline/Tunnel and Intakes 1–5 (15,000 cfs; Operational Scenario D)**

#### **Impact CUL-1: Effects on identified archaeological sites resulting from construction of conveyance facilities**

##### **Identified Resources**

Record searches at the CHRIS and inventory efforts have identified previously recorded prehistoric archaeological sites in the footprint of this alternative: CA-Sac-56, CA-Sac-57, CA-Sac-59, CA-Sac-65/H, and CA-Sac-328 (the same set of resources affected by Alternative 1A). Record searches also identified an historic archaeological site, CA-SJO-220H, in the footprint of this alternative. Detailed site descriptions summarizing available information regarding these resources, are provided in Appendix 18B.

Collectively, these six previously recorded resources represent the known resources that occur in the footprint of this alternative. The resources are distributed evenly across the alignment, but are somewhat clustered where construction of large above-ground features would occur, such as the northern end of the alignment, at the intermediate forebay, and at the southern end of the alignment.

##### **Significance of Identified Prehistoric and Historic Resources**

The resources affected by this alternative have likely have significance and integrity within the meaning of the NRHP and CRHR for the same reasons described above under Alternative 1A.

##### **Anticipated Effects on Identified Resources**

Ground-disturbing construction is likely to disturb the deposits and thus materially their ability to convey their significance. Much of the data potential in archaeological resources exists in the spatial associations of different artifacts and other cultural material. Where artifacts that have known associations with particular time periods occur adjacent to other material such as faunal bone or plant remains from subsistence activity, the proximity of the materials allows an inference as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence strategies during different prehistoric periods. Intrusive ground-disturbing construction may disrupt these associations and thus disrupt the qualities for which the sites qualify as historical resources. For these reasons, construction has the potential to materially impair these resources under CEQA and to adversely affect the resources as defined by Section 106 of the NHPA. This effect would be adverse.

**CEQA Conclusion:** Construction of conveyance facilities would affect identified archaeological resources that occur in the footprint of this alternative. DWR has evaluated these resources and finds they are likely to qualify as historical resources under CEQA, as described in detail in Appendix 18B. This impact would be significant because construction could materially alter or destroy the potential of these resources to yield information useful in archaeological research, the basis for the significance of these resources, through excavation and disruption of the spatial associations that contain meaningful information. Mitigation Measure CUL-1a would reduce this impact, but would not guarantee that all of the scientifically important material would be retrieved because feasible archaeological excavation only typically retrieves a sample of the deposit, and portions of the site may remain after treatment with important information. Construction could damage these remaining portions of the deposit. Therefore, this impact is significant and unavoidable.

**Mitigation Measure CUL-1: Prepare a data recovery plan and perform data recovery excavations on the affected portion of the deposits of identified and significant archaeological sites**

Please refer to Mitigation Measure CUL-1 under Alternative 1A.

**Impact CUL-2: Effects on archaeological sites to be identified through future inventory efforts**

This impact is substantially similar to Impact CUL-2 described under Alternative 1A. The same intakes would be constructed, and thus the overall potential for effects on archaeological resources to be identified through inventory efforts is similar.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. The locations of various features such as intakes, forebays, and tunnels shaft locations are depicted in Figure M3-1 in the mapbook volume. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of these resources to yield data useful in research. While Mitigation Measure CUL-2 would reduce these effects, it cannot guarantee all effects would be avoided because relocation of proposed facilities to avoid all resources is unlikely. These effects would remain adverse.

**CEQA Conclusion:** The right-of-way for this alternative is sensitive for both prehistoric and historic-era resources that cannot be identified at this time because much of the right-of-way is not legally accessible. Because many of these resources are likely to have data useful in prehistoric and historic archaeological research, as well as the integrity to convey this significance, they are likely to qualify as historical resources or unique archaeological sites under CEQA or historic properties under the Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of these resources by disrupting the spatial associations that could yield important data, resulting in a significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot guarantee that all eligible or significant resources would be preserved in place, or that all important data would be retrieved before construction destroys these resources. The scale of the BDCP, investment into existing designs, and the presence of other important environmental resources such as habitat, natural communities, and wetlands that should be avoided are constraints on the flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

## **Mitigation Measure CUL-2: Conduct inventory, evaluation, and treatment of archaeological resources**

Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

### **Impact CUL-3: Effects on archaeological sites that may not be identified through inventory efforts**

This impact is substantially similar to Impact CUL-3 described under Alternative 1A. The same intakes would be constructed, and thus the overall potential for effects on archaeological resources is similar.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of these resources to yield data useful in research. Mitigation Measure CUL-3 would reduce these effects, but cannot guarantee that all effects would be avoided because inadvertent disturbance of some resources is inevitable given the scale of the proposed construction. These effects would therefore remain adverse.

**CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb previously unidentified archaeological sites qualifying as historical resources, historic properties, or unique archaeological resources. Because direct excavation, compaction, or other disturbance may disrupt the spatial associations that contain scientifically useful information it would alter the potential basis for eligibility, thus materially altering the resource and resulting in a significant effect. Because these resources would not be identified prior to construction, they cannot be recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-3 would reduce but not entirely avoid the potential for this impact, by implementing construction worker training, monitoring and discovery protocols. However, because archaeological resources may not be identified prior to disturbance through these measures, the effect cannot be entirely avoided. Therefore, this impact would remain significant and unavoidable.

## **Mitigation Measure CUL-3: Implement an archaeological resources discovery plan, perform training of construction workers, and conduct construction monitoring**

Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

### **Impact CUL-4: Effects on buried human remains damaged during construction**

The footprint of this alternative is sensitive for buried human remains that may occur in isolation, rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact mechanisms are substantially similar to the sensitivity and impact mechanisms described under Alternative 1A. The same intakes would be constructed, and thus the overall potential for effects on buried human remains is similar.

Ground disturbing construction has the potential to damage and disinter buried human remains, resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect remains adverse.

**CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human remains. Construction would likely result in disturbance of these features. Disturbance of human remains, including remains interred outside of cemeteries is considered a significant impact in the CEQA Appendix G checklist, therefore disturbance of these remains would result in a significant effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-significant level because mitigation would not guarantee that these features could be discovered and treated in advance of construction; the scale of construction makes it technically and economically infeasible to perform the level of sampling necessary to identify all such resources prior to construction. Therefore, this impact is considered significant and unavoidable.

**Mitigation Measure CUL-4: Follow state and federal law governing human remains if such resources are discovered during construction**

Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

**Impact CUL-5: Direct and indirect effects on eligible and potentially eligible historic architectural/built environment-resources resulting from construction activities**

A total of seventy-seven (77) resources would be affected by this alternative. A table of these historically significant properties, their attributes, and whether or not the impacts are direct or indirect can be found in Appendix 18B. These affected resources are the same resources described in Alternative 1A. These built resources include previously identified resources and resources newly determined to appear have significance under the CRHR and NRHP for the same reasons described under Alternative 1A. These properties also retain enough integrity to convey their historic significance because the setting and character defining elements of these properties remain largely intact. The majority of these properties are located in the northern third of the alignment, near the intakes and the northern forebay.

**Anticipated Effects on Identified Resources**

Direct effects on identified resources associated with this alternative include demolition of these resources to place intakes, a forebay, transmission lines, tunnel muck work areas or other areas of surface impact, and concrete batch plants and fuel stations adjacent to the alignment. Direct effects may also occur through damage resulting from construction-generated vibration which can result in structural damage or foundation subsidence. Even if the resources can be avoided they may be subject to indirect effects resulting from permanent changes to the visual setting caused by construction of the nearby intakes, transmission lines, poles, and towers, pumping plants, or tunnel muck work areas if the soil is not removed upon the completion of construction and the land restored to its original condition. These new features would cause indirect effects because new facilities would be inconsistent with the rural feeling, setting, and association that contributes, in part, to the significance of these built environment cultural resources. These resources and the effect mechanism (direct or indirect) are provided in Appendix 18B. Facility redesign to avoid direct impacts on historic architectural resources is preferred as mitigation if possible. However, it is unlikely that all identified resources can be avoided because of the scale of the BDCP and the need to balance avoidance of other important environmental resources such as wetlands, natural communities, and special-status species habitat. These effects would materially impair the resources within the meaning of CEQA and result in adverse effects within the meaning of Section 106 because they would diminish the characteristics that convey the significance of the resources. Direct

demolition and indirect effects are likely to occur even with mitigation. Therefore, these effects would be adverse.

**CEQA Conclusion:** Seventy-seven eligible and potentially eligible historic-era built environment resources have been identified in the footprint of this alternative. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

**Mitigation Measure CUL-5: Implement a built environment treatment plan, consult with relevant parties, and implement treatment**

Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

**Impact CUL-6: Direct and indirect effects on unidentified and unevaluated historic architectural/built environment resources resulting from construction activities**

The footprint of this alternative is sensitive for unidentified and unevaluated built environment resources that may have significance and integrity for the same reasons described under Alternative 1A. A total of 37 unevaluated built environment resources have been identified that may be subject to direct or indirect effects as a result of the construction of this alternative.

**Anticipated Effects**

Construction may result in direct demolition of these resources, damage through vibration, or indirect effects such as changes to the setting. While mitigation is available to reduce these effects, this mitigation cannot guarantee that all effects would be avoided because mitigation cannot guarantee that eligible resources would be avoided and that adverse changes to the setting would not occur. Construction has the potential to directly or indirectly damage built environment resources through demolition or introduction of new inconsistent features into the setting. These changes would impair the ability of the resources to convey their significance because the character defining elements or setting of the resource would be lost. Therefore, impacts on these resources may be adverse.

**CEQA Conclusion:** The BDCP area is sensitive for built environment resources that have not yet been recorded and evaluated because the majority of the BDCP area is legally inaccessible, and inventory efforts have not gathered information in these inaccessible areas. Many of these resources are likely to be associated with important historical themes or persons, or possess high creative values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of these resources remain intact and retain their rural agricultural setting they are also likely to have integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or historical resources under the NHPA and CEQA. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be



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material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

**Mitigation Measure CUL-6: Conduct a survey of inaccessible properties to assess eligibility, determine if these properties will be adversely impacted by the project, and include the treatment of these properties in the mitigation plans for known properties to resolve or mitigate adverse impacts.**

Please refer to Mitigation Measure CUL-6 under Alternative 1A.

#### **Impact CUL-7: Effects of conservation measures on cultural resources**

This impact describes the potential effects of other conservation measures at a program level of detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar to Impact CUL-7 as discussed under Alternative 1A because the nature of the affected resources, scope of activities, and geographic area of effects are generally similar. These measures would result in effects on cultural resources when ground-disturbing work is performed to construct improvements and enhance or restore natural communities. Direct effects would occur through demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic archaeological sites, unique archaeological sites, TCPs, human remains, and built environment resources. Indirect effects may occur where changes to the setting alter the existing setting in a manner that is inconsistent with the feeling and association of the resource. Because the ability of the resources to convey their significance would be lost this effect would materially alter these resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural landscapes that are converted to habitat may no longer convey the themes of agriculture and settlement, and thus would be inconsistent with remaining features associated with rural historic landscapes created by reclamation, cultivation, and ranching.

Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of land included in all conservation measures that would be implemented under this alternative, it is unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique archaeological sites could be avoided. Therefore, this impact would be adverse.

**CEQA Conclusion:** Construction and implementation of conservation measures would result in ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and built environment resources such as historic architectural structures and rural historic landscapes. The same construction may damage unique archaeological sites. This construction would likely result in materially adverse changes for the following reasons:

- ground disturbing construction in archaeological sites disrupts the spatial associations that contain data useful in research, thus diminishing or destroying the basis for the significance of the resource, and;

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- ground disturbing construction may either directly demolish or indirectly affect the setting of built environment resources, resulting in an inability of the resource to convey its significance, and;
- ground disturbing construction may either directly demolish or change the setting of traditional cultural properties resulting in an inability of the resource to convey its significance.
- ground disturbing construction may inadvertently disturb human remains.

The alteration of a resource that changes the characteristics that convey its significance is a material alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under CEQA under the Appendix G checklist. Because this construction would materially alter these categories of resources and disturb human remains it would result in a significant impact. Mitigation is available to reduce these impacts by identifying and evaluating resources, avoiding resources where possible, and developing treatment where avoidance is not possible. In addition construction would be monitored. However, because of the acreage associated with the proposed restoration under conservation measures, as well as the multiple constraints associated with other environmental resources that require mitigation or avoidance, it is unlikely that all cultural resources could be avoided. Therefore, this impact remains significant and unavoidable.

#### **Mitigation Measure CUL-7: Conduct cultural resource studies and adopt cultural resource mitigation measures for cultural resource impacts associated with conservation component implementation**

Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A

#### **Impact CUL-8: Compatibility of the proposed water conveyance facilities and other conservation measures with plans and policies**

Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could result in the potential for incompatibilities with plans and policies adopted to protect the cultural resources of the Delta. A number of plans and policies that coincide with the study area provide guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether Alternative 6A is compatible or incompatible with these policies, rather than whether impacts are adverse or not adverse or significant or less than significant. Because Alternative 6A would result in the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the BDCP will be compatible with these policies because significant cultural resources will be avoided where feasible, and mitigation will be implemented to reduce effects where avoidance and preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

**CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by the various counties with jurisdiction in this region. For policies that emphasize preservation or

mitigation the BDCP will be compatible with these policies because DWR and Reclamation will implement cultural resource management practices that will identify significant resources, preserve such resources where feasible, and complete mitigation to reduce significant effects where preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

### **18.3.5.12 Alternative 6B—Isolated Conveyance with East Alignment and Intakes 1–5 (15,000 cfs; Operational Scenario D)**

#### **Impact CUL-1: Effects on identified archaeological sites resulting from construction of conveyance facilities**

##### **Identified Resources**

Record searches at the CHRIS and inventory efforts have identified 15 previously recorded prehistoric archaeological sites in the footprint of this alternative (the same set of sites would be affected as Alternative 1B). Detailed site descriptions summarizing available information regarding these resources, are provided in Appendix 18B. These sites are distributed more heavily towards the northern and southern end of the alignment.

##### **Significance of Identified Prehistoric and Historic Resources**

The resources affected by this alternative have likely have significance and integrity within the meaning of the NRHP and CRHR for the same reasons described above under Alternative 1B.

##### **Anticipated Effects on Identified Resources**

Ground-disturbing construction is likely to disturb the deposits and thus materially their ability to convey their significance. Much of the data potential in archaeological resources exists in the spatial associations of different artifacts and other cultural material. Where artifacts that have known associations with particular time periods occur adjacent to other material such as faunal bone or plant remains from subsistence activity, the proximity of the materials allows an inference as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence strategies during different prehistoric periods. Intrusive ground-disturbing construction may disrupt these associations and thus disrupt the qualities for which the sites qualify as historical resources. For these reasons, construction has the potential to materially impair these resources under CEQA and to adversely affect the resources as defined by Section 106 of the NHPA. This effect would be adverse.

**CEQA Conclusion:** Construction of conveyance facilities would affect identified archaeological resources that occur in the footprint of this alternative. DWR has evaluated these resources and finds they are likely to qualify as historical resources under CEQA, as described in detail in Appendix 18B. This impact would be significant because construction could materially alter or destroy the potential of these resources to yield information useful in archaeological research, the basis for the significance of these resources, through excavation and disruption of the spatial associations that

contain meaningful information. Mitigation Measure CUL-1a would reduce this impact, but would not guarantee that all of the scientifically important material would be retrieved because feasible archaeological excavation only typically retrieves a sample of the deposit, and portions of the site may remain after treatment with important information. Construction could damage these remaining portions of the deposit. Therefore, this impact is significant and unavoidable.

**Mitigation Measure CUL-1: Prepare a data recovery plan and perform data recovery excavations on the affected portion of the deposits of identified and significant archaeological sites**

Please refer to Mitigation Measure CUL-1 under Alternative 1A.

**Impact CUL-2: Effects on archaeological sites to be identified through future inventory efforts**

This impact is generally similar to Impact CUL-2 described under Alternative 1B. This alternative is sensitive for previously unidentified archaeological resources that are likely to be significant and to have integrity for the same reasons as described under Alternative 1B. It should be noted however, that the eastern canal would cross more sensitive soil formations and result in continuous ground-disturbance that may have a slightly greater potential to affect unidentified prehistoric archaeological resources compared to Alternative 1B and Alternative 1C. Figure 1 in Appendix 18A depicts the eastern canal relative to archaeologically sensitive soil formations. The general sensitivity for historic-era archaeological resources is similar to Alternative 1B.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of these resources to yield data useful in research. The locations of ground disturbing features such as the canal, access roads, pumping plants, borrow areas and concrete batch plants are depicted in Figure M3-2 in the mapbook volume. While Mitigation Measure CUL-2 would reduce these effects, it cannot guarantee all effects would be avoided because relocation of proposed facilities to avoid all resources is unlikely. These effects would remain adverse.

**CEQA Conclusion:** The right-of-way for this alternative is sensitive for both prehistoric and historic-era resources that cannot be identified at this time because the much of the right-of-way is not legally accessible. Because many of these resources are likely to have data useful in prehistoric and historic archaeological research, as well as the integrity to convey this significance, they are likely to qualify as historical resources or unique archaeological sites under CEQA or historic properties under the Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of these resources by disrupting the spatial associations that could yield important data, resulting in a significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot guarantee that all eligible or significant resources would be preserved in place, or that all important data would be retrieved before construction destroys these resources. The scale of the BDCP, investment into existing designs, and the presence of other important environmental resources such as habitat, natural communities, and wetlands that should be avoided are constraints on the flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

## **Mitigation Measure CUL-2: Conduct inventory, evaluation, and treatment of archaeological resources**

Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

### **Impact CUL-3: Effects on archaeological sites that may not be identified through inventory efforts**

Because archaeological sites that are likely to qualify as historical resources and historic properties have been identified in the footprint of this alternative, the remaining portion of the right-of-way for this conveyance feature is sensitive for previously unidentified prehistoric archaeological resources. This sensitivity and the potential impact mechanisms are substantially similar to the sensitivity and impact mechanism described for Alternative 1B. It should be noted however, that the eastern canal would cross more sensitive soil formations and result in continuous ground-disturbance that may have a slightly greater potential to affect unidentified prehistoric archaeological resources compared to Alternative 1A and Alternative 1C. Figure 1 in Appendix 18A depicts the eastern canal relative to archaeologically sensitive soil formations. The general sensitivity for historic-era archaeological resources is similar to Alternative 1A.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of these resources to yield data useful in research. Mitigation Measure CUL-3 would reduce these effects, but cannot guarantee that all effects would be avoided because inadvertent disturbance of some resources is inevitable given the scale of the proposed construction. These effects would therefore remain adverse.

**CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb previously unidentified archaeological sites qualifying as historical resources, historic properties, or unique archaeological resources. Because direct excavation, compaction, or other disturbance may disrupt the spatial associations that contain scientifically useful information it would alter the potential basis for eligibility, thus materially altering the resource and resulting in a significant effect. Because these resources would not be identified prior to construction, they cannot be recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-3 would reduce but not entirely avoid the potential for this impact, by implementing construction worker training, monitoring and discovery protocols. However, because archaeological resources may not be identified prior to disturbance through these measures, the effect cannot be entirely avoided. Therefore, this impact would remain significant and unavoidable.

## **Mitigation Measure CUL-3: Implement an archaeological resources discovery plan, perform training of construction workers, and conduct construction monitoring**

Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

### **Impact CUL-4: Effects on buried human remains damaged during construction**

The footprint of this alternative is sensitive for buried human remains that may occur in isolation, rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact

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mechanisms are substantially similar to the sensitivity and impact mechanisms described under Alternative 1B. However, because the eastern canal crosses more sensitive soil formations and may result in greater continuous ground disturbance than 1A and Alternative 1C, the potential for impacts on buried human remains may be slightly higher than described for Alternative 1A and 1C.

Ground disturbing construction has the potential to damage and disinter buried human remains, resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect remains adverse.

**CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human remains. Construction would likely result in disturbance of these features. Disturbance of human remains, including remains interred outside of cemeteries is considered a significant impact in the CEQA Appendix G checklist, therefore disturbance of these remains would result in a significant effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-significant level because mitigation would not guarantee that these features could be discovered and treated in advance of construction; the scale of construction makes it technically and economically infeasible to perform the level of sampling necessary to identify all such resources prior to construction. Therefore, this impact is considered significant and unavoidable.

#### **Mitigation Measure CUL-4: Follow state and federal law governing human remains if such resources are discovered during construction**

Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

#### **Impact CUL-5: Direct and indirect effects on eligible and potentially eligible historic architectural/built environment-resources resulting from construction activities**

A total of ninety-three (93) resources would be affected by this alternative. A table of these historically significant properties, their attributes, and whether or not the impacts are direct or indirect can be found in Appendix 18B. These affected resources are the same resources described in Alternative 1B. These built resources include previously identified resources and newly identified resources that have significance under the CRHR and NRHP for the same themes described for Alternative 1B. These properties also retain enough integrity to convey their historic significance because the setting and the character defining features of these properties remain largely intact. While the majority of these properties are located in the northern third of the alignment, in the area south of the San Joaquin River, north of the existing forebay, there are several larger agricultural properties that will also be affected.

#### **Anticipated Effects on Identified Resources**

Direct effects on identified resources associated with this alternative include demolition of these resources to place intakes, transmission lines, areas of surface impact, and concrete batch plants and fuel stations adjacent to the alignment. Direct effects may also occur through damage resulting from construction-generated vibration which can result in structural damage or foundation subsidence. Even if the resources can be avoided they may be subject to indirect effects resulting from permanent changes to the visual setting caused by construction of the nearby intakes, transmission lines, poles, towers, pumping plants, or tunnel muck work areas if the soil is not removed upon the completion of construction and the land restored to its original condition. These new features would cause indirect effects because new facilities would be inconsistent with the rural feeling, setting, and

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association that contributes, in part, to the significance of these built environment cultural resources. These resources and the effect mechanism (direct or indirect) are provided in Appendix 18B. Facility redesign to avoid direct impacts on historic architectural resources is preferred as mitigation if possible. However, it is unlikely that all identified resources can be avoided because of the scale of the BDCP and the need to balance avoidance of other important environmental resources such as wetlands, natural communities, and special-status species habitat. These effects would materially impair the resources within the meaning of CEQA and result in adverse effects within the meaning of Section 106 because they would diminish the characteristics that convey the significance of the resources. Direct demolition and indirect effects are likely to occur even with mitigation. Therefore, these effects would be adverse.

**CEQA Conclusion:** Ninety-three eligible and potentially eligible historic-era built environment resources have been identified in the footprint of this alternative. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

#### **Mitigation Measure CUL-5: Implement a built environment treatment plan, consult with relevant parties, and implement treatment**

Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

#### **Impact CUL-6: Direct and indirect effects on unidentified and unevaluated historic architectural/built environment resources resulting from construction activities**

The footprint of this alternative is sensitive for unidentified and unevaluated built environment resources that may have significance and integrity for the same reasons described under Alternative 1B. A total of 78 unevaluated built environment resources have been identified that may be subject to direct or indirect effects as a result of the construction of this alternative.

#### **Anticipated Effects**

Construction may result in direct demolition of these resources, damage through vibration, or indirect effects such as changes to the setting. While mitigation is available to reduce these effects, this mitigation cannot guarantee that all effects would be avoided because mitigation cannot guarantee that eligible resources would be avoided and that adverse changes to the setting would not occur. Construction has the potential to directly or indirectly damage built environment resources through demolition or introduction of new inconsistent features into the setting. These changes would impair the ability of the resources to convey their significance because the character defining elements or setting of the resource would be lost, resulting in a materially adverse change and adverse effect. Therefore, impacts on these resources may be adverse.

**CEQA Conclusion:** The BDCP area is sensitive for built environment resources that have not yet been recorded and evaluated because the majority of the BDCP area is legally inaccessible, and inventory

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efforts have not gathered information in these inaccessible areas. Many of these resources are likely to be associated with important historical themes or persons, or possess high creative values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of these resources remain intact and retain their rural agricultural setting they are also likely to have integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or historical resources under the NHPA and CEQA. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

**Mitigation Measure CUL-6: Conduct a survey of inaccessible properties to assess eligibility, determine if these properties will be adversely impacted by the project, and include the treatment of these properties in the mitigation plans for known properties to resolve or mitigate adverse impacts.**

Please refer to Mitigation Measure CUL-6 under Alternative 1A.

#### **Impact CUL-7: Effects of conservation measures on cultural resources**

This impact describes the potential effects of other conservation measures at a program level of detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar to Impact CUL-7 as discussed under Alternative 1A because the nature of the affected resources, scope of activities, and geographic area of effects are generally similar. These measures would result in effects on cultural resources when ground-disturbing work is performed to construct improvements and enhance or restore natural communities. Direct effects would occur through demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic archaeological sites, unique archaeological sites, TCPs, human remains, and built environment resources. Indirect effects may occur where changes to the setting alter the existing setting in a manner that is inconsistent with the feeling and association of the resource. Because the ability of the resources to convey their significance would be lost this effect would materially alter these resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural landscapes that are converted to habitat may no longer convey the themes of agriculture and settlement, and thus would be inconsistent with remaining features associated with rural historic landscapes created by reclamation, cultivation, and ranching.

Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of land included in all conservation measures that would be implemented under this alternative, it is unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique archaeological sites could be avoided. Therefore, this impact would be adverse.

**CEQA Conclusion:** Construction and implementation of conservation measures would result in ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and



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built environment resources such as historic architectural structures and rural historic landscapes. The same construction may damage unique archaeological sites. This construction would likely result in materially adverse changes for the following reasons:

- ground disturbing construction in archaeological sites disrupts the spatial associations that contain data useful in research, thus diminishing or destroying the basis for the significance of the resource, and;
- ground disturbing construction may either directly demolish or indirectly affect the setting of built environment resources, resulting in an inability of the resource to convey its significance, and;
- ground disturbing construction may either directly demolish or change the setting of traditional cultural properties resulting in an inability of the resource to convey its significance.
- ground disturbing construction may inadvertently disturb human remains.

The alteration of a resource that changes the characteristics that convey its significance is a material alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under CEQA under the Appendix G checklist. Because this construction would materially alter these categories of resources and disturb human remains it would result in a significant impact. Mitigation is available to reduce these impacts by identifying and evaluating resources, avoiding resources where possible, and developing treatment where avoidance is not possible. In addition construction would be monitored. However, because of the acreage associated with the proposed restoration under conservation measures, as well as the multiple constraints associated with other environmental resources that require mitigation or avoidance, it is unlikely that all cultural resources could be avoided. Therefore, this impact remains significant and unavoidable.

#### **Mitigation Measure CUL-7: Conduct cultural resource studies and adopt cultural resource mitigation measures for cultural resource impacts associated with conservation component implementation**

Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A

#### **Impact CUL-8: Compatibility of the proposed water conveyance facilities and other conservation measures with plans and policies**

Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could result in the potential for incompatibilities with plans and policies adopted to protect the cultural resources of the Delta. A number of plans and policies that coincide with the study area provide guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether Alternative 6B is compatible or incompatible with these policies, rather than whether impacts are adverse or not adverse or significant or less than significant. Because Alternative 6B would result in the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the BDCP will be compatible with these policies because significant cultural resources will be avoided where feasible, and mitigation will be implemented to reduce effects where avoidance and preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible

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because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

**CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by the various counties with jurisdiction in this region. For policies that emphasize preservation or mitigation the BDCP will be compatible with these policies because DWR and Reclamation will implement cultural resource management practices that will identify significant resources, preserve such resources where feasible, and complete mitigation to reduce significant effects where preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

### 18.3.5.13 Alternative 6C—Isolated Conveyance with West Alignment and Intakes W1–W5 (15,000 cfs; Operational Scenario D)

#### Impact CUL-1: Effects on identified archaeological sites resulting from construction of conveyance facilities

##### Identified Resources

Record searches at the CHRIS and inventory efforts have identified 10 previously recorded prehistoric archaeological sites in the footprint of this alternative as described in Appendix 18B. Detailed site descriptions summarizing available information regarding these resources, are provided in Appendix 18B. In addition, two historic archaeological sites have been identified in the footprint of this alternative; CA-CC0-584H and CA-Yol-165H. This is the same set of resources affected by Alternative 1C and Alternative 2C.

These sites are distributed more heavily towards the northern and southern end of the alignment where ground-disturbing effects of the western canal are concentrated.

##### Significance of Identified Prehistoric and Historic Resources

The resources affected by this alternative have likely have significance and integrity within the meaning of the NRHP and CRHR for the same reasons described above under Alternative 1C. CA-Yol-165H does not have sufficient integrity to convey significance and therefore does not qualify as an historical resource or historic property.

##### Anticipated Effects on Identified Resources

Ground-disturbing construction is likely to disturb the deposits and thus materially their ability to convey their significance. Much of the data potential in archaeological resources exists in the spatial associations of different artifacts and other cultural material. Where artifacts that have known associations with particular time periods occur adjacent to other material such as faunal bone or

plant remains from subsistence activity, the proximity of the materials allows an inference as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence strategies during different prehistoric periods. Intrusive ground-disturbing construction may disrupt these associations and thus disrupt the qualities for which the sites qualify as historical resources. For these reasons, construction has the potential to materially impair these resources under CEQA and to adversely affect the resources as defined by Section 106 of the NHPA. This effect would be adverse.

**CEQA Conclusion:** Construction of conveyance facilities would affect identified archaeological resources that occur in the footprint of this alternative. DWR has evaluated these resources and finds they are likely to qualify as historical resources under CEQA, as described in detail in Appendix 18B. This impact would be significant because construction could materially alter or destroy the potential of these resources to yield information useful in archaeological research, the basis for the significance of these resources, through excavation and disruption of the spatial associations that contain meaningful information. Mitigation Measure CUL-1a would reduce this impact, but would not guarantee that all of the scientifically important material would be retrieved because feasible archaeological excavation only typically retrieves a sample of the deposit, and portions of the site may remain after treatment with important information. Construction could damage these remaining portions of the deposit. Therefore, this impact is significant and unavoidable.

**Mitigation Measure CUL-1: Prepare a data recovery plan and perform data recovery excavations on the affected portion of the deposits of identified and significant archaeological sites**

Please refer to Mitigation Measure CUL-1 under Alternative 1A.

**Impact CUL-2: Effects on archaeological sites to be identified through future inventory efforts**

This impact is generally similar to Impact CUL-2 described under Alternative 1C. This alternative is sensitive for previously unidentified archaeological resources that are likely to be significant and to have integrity for the same reasons as described under Alternative 1C. It should be noted however, that the western canal would cross more sensitive soil formations along the northern and southern ends of the alignment compared to Alternative 1A and the eastern canal. The middle segment of this alternative would make use of a subterranean tunnel that crosses low-sensitivity soil units. The overall sensitivity for prehistoric archaeological resources may be slightly higher than Alternative 1A and the eastern canal because of the relative proportion of high sensitivity geological formations. Figure 1 in Appendix 18A depicts the western canal relative to archaeologically sensitive soil formations. The general sensitivity for historic-era archaeological resources is similar to Alternative 1A.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. The location of ground disturbing features such as intakes, the canal, tunnel segment, and borrow areas are depicted in Figure M3-3 in the mapbook volume. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of these resources to yield data useful in research. While Mitigation Measure CUL-2 would reduce these effects, it cannot guarantee all effects would be

avoided because relocation of proposed facilities to avoid all resources is unlikely. These effects would remain adverse.

**CEQA Conclusion:** The right-of-way for this alternative is sensitive for both prehistoric and historic-era resources that cannot be identified at this time because the much of the right-of-way is not legally accessible. Because many of these resources are likely to have data useful in prehistoric and historic archaeological research, as well as the integrity to convey this significance, they are likely to qualify as historical resources or unique archaeological sites under CEQA or historic properties under the Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of these resources by disrupting the spatial associations that could yield important data, resulting in a significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot guarantee that all eligible or significant resources would be preserved in place, or that all important data would be retrieved before construction destroys these resources. The scale of the BDCP, investment into existing designs, and the presence of other important environmental resources such as habitat, natural communities, and wetlands that should be avoided are constraints on the flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

**Mitigation Measure CUL-2: Conduct inventory, evaluation, and treatment of archaeological resources**

Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

**Impact CUL-3: Effects on archaeological sites that may not be identified through inventory efforts**

Because archaeological sites that are likely to qualify as historical resources and historic properties have been identified in the footprint of this alternative, the remaining portion of the right-of-way for this conveyance feature is sensitive for previously unidentified prehistoric archaeological resources. This sensitivity and the potential impact mechanisms are substantially similar to the sensitivity and impact mechanism described for Alternative 1C. It should be noted however, that the western canal would cross more sensitive soil formations along the northern and southern ends of the alignment compared to the tunnel and eastern canal. The middle segment of this alternative would make use of a subterranean tunnel that crosses low-sensitivity soil units. The overall sensitivity for prehistoric archaeological resources may be slightly higher than the tunnel, but slightly lower than the eastern canal, because of the relative proportion of high sensitivity geological formations. Figure 1 in Appendix 18A depicts the western canal relative to archaeologically sensitive soil formations. The general sensitivity for historic-era archaeological resources is similar to the tunnel and eastern canal.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of these resources to yield data useful in research. Mitigation Measure CUL-3 would reduce these effects, but cannot guarantee that all effects would be avoided because inadvertent disturbance of some resources is inevitable given the scale of the proposed construction. These effects would therefore remain adverse.

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**CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb previously unidentified archaeological sites qualifying as historical resources, historic properties, or unique archaeological resources. Because direct excavation, compaction, or other disturbance may disrupt the spatial associations that contain scientifically useful information it would alter the potential basis for eligibility, thus materially altering the resource and resulting in a significant effect. Because these resources would not be identified prior to construction, they cannot be recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-3 would reduce but not entirely avoid the potential for this impact, by implementing construction worker training, monitoring and discovery protocols. However, because archaeological resources may not be identified prior to disturbance through these measures, the effect cannot be entirely avoided. Therefore, this impact would remain significant and unavoidable.

**Mitigation Measure CUL-3: Implement an archaeological resources discovery plan, perform training of construction workers, and conduct construction monitoring**

Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

**Impact CUL-4: Effects on buried human remains damaged during construction**

The footprint of this alternative is sensitive for buried human remains that may occur in isolation, rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact mechanisms are substantially similar to the sensitivity and impact mechanisms described under Alternative 1C. However, because the western canal crosses more sensitive soil formations and may result in greater continuous ground disturbance than the tunnel option, the potential for impacts on buried human remains may be slightly higher than described for the tunnel option. Based on the relative proportion of geologically sensitive map units, the western canal may be slightly lower in sensitivity for buried human remains compared to the eastern canal.

Ground disturbing construction has the potential to damage and disinter buried human remains, resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect remains adverse.

**CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human remains. Construction would likely result in disturbance of these features. Disturbance of human remains, including remains interred outside of cemeteries is considered a significant impact in the CEQA Appendix G checklist, therefore disturbance of these remains would result in a significant effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-significant level because mitigation would not guarantee that these features could be discovered and treated in advance of construction; the scale of construction makes it technically and economically infeasible to perform the level of sampling necessary to identify all such resources prior to construction. Therefore, this impact is considered significant and unavoidable.

**Mitigation Measure CUL-4: Follow state and federal law governing human remains if such resources are discovered during construction**

Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

### **Impact CUL-5: Direct and indirect effects on eligible and potentially eligible historic architectural/built environment-resources resulting from construction activities**

A total of fifty-six (56) built environment resources would be affected by this alternative. A table of these historically significant properties, their attributes, and whether or not the impacts are direct or indirect can be found in Appendix 18B. These affected resources are substantially similar to the resources described in Alternative 1C; however the Hood Historic District, containing thirty-four (34) resources would not be affected. In addition, six of the significant ranches/agricultural properties and rural single-family/multiple-family properties that would be affected by Alternative 1C would not be affected by Alternative 2C, however three additional significant ranches/agricultural properties and rural single-family/multiple-family properties not affected by Alternative 1C would be affected by Alternative 2C. The bridge, the school, the sugar plant, and thirteen accessible islands are affected by all alternatives under the East option.

These built resources include previously identified resources and newly recorded resources that are significance under the NRHP and CRHR under the same significance themes described under Alternative 1C. These properties also retain enough integrity to convey their historic significance because the setting and character defining features of these properties remain largely intact. While the majority of these properties are located in the northern third of the alignment, in the area south of the San Joaquin River, north of the existing forebay, there are several larger agricultural properties that will also be affected.

#### **Anticipated Effects on Identified Resources**

Direct effects on identified resources associated with this alternative include demolition of these resources to place intakes, areas of surface impact, transmission lines, and concrete batch plants and fuel stations adjacent to the alignment. Direct effects may also occur through damage resulting from construction-generated vibration which can result in structural damage or foundation subsidence. Even if the resources can be avoided they may be subject to indirect effects resulting from permanent changes to the visual setting caused by construction of the nearby intakes, transmission lines, poles, and towers, pumping plants, or areas of surface impact if, upon the completion of construction, the land is not restored to its original condition. These new features would cause indirect effects because new facilities would be inconsistent with the rural feeling, setting, and association that contributes, in part, to the significance of these built environment cultural resources. These resources and the effect mechanism (direct or indirect) are provided in Appendix 18B. Facility redesign to avoid direct impacts on historic architectural resources is preferred as mitigation if possible. However, it is unlikely that all identified resources can be avoided because of the scale of the BDCP and the need to balance avoidance of other important environmental resources such as wetlands, natural communities, and special-status species habitat. These effects would materially impair the resources within the meaning of CEQA and result in adverse effects within the meaning of Section 106 because they would diminish the characteristics that convey the significance of the resources. Direct demolition and indirect effects are likely to occur even with mitigation. Therefore, these effects would be adverse.

**CEQA Conclusion:** Fifty-six eligible and potentially eligible historic-era built environment resources have been identified in the footprint of this alternative. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource

character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

**Mitigation Measure CUL-5: Implement a built environment treatment plan, consult with relevant parties, and implement treatment**

Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

**Impact CUL-6: Direct and indirect effects on unidentified and unevaluated historic architectural/built environment resources resulting from construction activities**

The footprint of this alternative is sensitive for unidentified and unevaluated built environment resources that may have significance and integrity for the same reasons described under Alternative 1C. A total of 67 unevaluated built environment resources have been identified that may be subject to direct or indirect effects as a result of the construction of this alternative.

**Anticipated Effects**

Construction may result in direct demolition of these resources, damage through vibration, or indirect effects such as changes to the setting. While mitigation is available to reduce these effects, this mitigation cannot guarantee that all effects would be avoided because mitigation cannot guarantee that eligible resources would be avoided and that adverse changes to the setting would not occur. Construction has the potential to directly or indirectly damage built environment resources through demolition or introduction of new inconsistent features into the setting. These changes would impair the ability of the resources to convey their significance because the character defining elements or setting of the resource would be lost. Therefore, impacts on these resources may be adverse.

**CEQA Conclusion:** The BDCP area is sensitive for built environment resources that have not yet been recorded and evaluated because the majority of the BDCP area is legally inaccessible, and inventory efforts have not gathered information in these inaccessible areas. Many of these resources are likely to be associated with important historical themes or persons, or possess high creative values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of these resources remain intact and retain their rural agricultural setting they are also likely to have integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or historical resources under the NHPA and CEQA. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

**Mitigation Measure CUL-6: Conduct a survey of inaccessible properties to assess eligibility, determine if these properties will be adversely impacted by the project, and include the treatment of these properties in the mitigation plans for known properties to resolve or mitigate adverse impacts.**

Please refer to Mitigation Measure CUL-6 under Alternative 1A.

**Impact CUL-7: Effects of conservation measures on cultural resources**

This impact describes the potential effects of other conservation measures at a program level of detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar to Impact CUL-7 as discussed under Alternative 1C because the nature of the affected resources, scope of activities, and geographic area of effects are generally similar. These measures would result in effects on cultural resources when ground-disturbing work is performed to construct improvements and enhance or restore natural communities. Direct effects would occur through demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic archaeological sites, unique archaeological sites, TCPs, human remains, and built environment resources. Indirect effects may occur where changes to the setting alter the existing setting in a manner that is inconsistent with the feeling and association of the resource. Because the ability of the resources to convey their significance would be lost this effect would materially alter these resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural landscapes that are converted to habitat may no longer convey the themes of agriculture and settlement, and thus would be inconsistent with remaining features associated with rural historic landscapes created by reclamation, cultivation, and ranching.

Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of land included in all conservation measures that would be implemented under this alternative, it is unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique archaeological sites could be avoided. Therefore, this impact would be adverse.

**CEQA Conclusion:** Construction and implementation of conservation measures would result in ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and built environment resources such as historic architectural structures and rural historic landscapes. The same construction may damage unique archaeological sites. This construction would likely result in materially adverse changes for the following reasons:

- ground disturbing construction in archaeological sites disrupts the spatial associations that contain data useful in research, thus diminishing or destroying the basis for the significance of the resource, and;
- ground disturbing construction may either directly demolish or indirectly affect the setting of built environment resources, resulting in an inability of the resource to convey its significance, and;
- ground disturbing construction may either directly demolish or change the setting of traditional cultural properties resulting in an inability of the resource to convey its significance.
- ground disturbing construction may inadvertently disturb human remains.



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The alteration of a resource that changes the characteristics that convey its significance is a material alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under CEQA under the Appendix G checklist. Because this construction would materially alter these categories of resources and disturb human remains it would result in a significant impact. Mitigation is available to reduce these impacts by identifying and evaluating resources, avoiding resources where possible, and developing treatment where avoidance is not possible. In addition construction would be monitored. However, because of the acreage associated with the proposed restoration under conservation measures, as well as the multiple constraints associated with other environmental resources that require mitigation or avoidance, it is unlikely that all cultural resources could be avoided. Therefore, this impact remains significant and unavoidable.

#### **Mitigation Measure CUL-7: Conduct cultural resource studies and adopt cultural resource mitigation measures for cultural resource impacts associated with conservation component implementation**

Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A

#### **Impact CUL-8: Compatibility of the proposed water conveyance facilities and other conservation measures with plans and policies**

Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could result in the potential for incompatibilities with plans and policies adopted to protect the cultural resources of the Delta. A number of plans and policies that coincide with the study area provide guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether Alternative 6C is compatible or incompatible with these policies, rather than whether impacts are adverse or not adverse or significant or less than significant. Because Alternative 6C would result in the same kinds of effects as Alternative 1C, this alternative is only compatible with some of the land use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the BDCP will be compatible with these policies because significant cultural resources will be avoided where feasible, and mitigation will be implemented to reduce effects where avoidance and preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

**CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by the various counties with jurisdiction in this region. For policies that emphasize preservation or mitigation the BDCP will be compatible with these policies because DWR and Reclamation will implement cultural resource management practices that will identify significant resources, preserve such resources where feasible, and complete mitigation to reduce significant effects where preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

### **18.3.5.14 Alternative 7—Dual Conveyance with Pipeline/Tunnel, Intakes 2, 3, and 5, and Enhanced Aquatic Conservation (9,000 cfs; Operational Scenario E)**

#### **Impact CUL-1: Effects on identified archaeological sites resulting from construction of conveyance facilities**

##### **Identified Resources**

Record searches at the CHRIS and inventory efforts have identified previously recorded prehistoric archaeological sites in the footprint of this alternative: CA-Sac-56, CA-Sac-57, CA-Sac-59, and CA-Sac-65/H. Record searches also identified an historic archaeological site, CA-SJO-220H, in the footprint of this alternative. Detailed site descriptions summarizing available information regarding these resources, are provided in Appendix 18B.

The resources are distributed evenly across the alignment, but are somewhat clustered where construction of large above-ground features would occur, such as the northern end of the alignment, at the intermediate forebay, and at the southern end of the alignment.

##### **Significance of Identified Prehistoric and Historic Resources**

The resources affected by this alternative have likely have significance and integrity within the meaning of the NRHP and CRHR for the same reasons described above under Alternative 1A.

##### **Anticipated Effects on Identified Resources**

Ground-disturbing construction is likely to disturb the deposits and thus materially their ability to convey their significance. Much of the data potential in archaeological resources exists in the spatial associations of different artifacts and other cultural material. Where artifacts that have known associations with particular time periods occur adjacent to other material such as faunal bone or plant remains from subsistence activity, the proximity of the materials allows an inference as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence strategies during different prehistoric periods. Intrusive ground-disturbing construction may disrupt these associations and thus disrupt the qualities for which the sites qualify as historical resources. For these reasons, construction has the potential to materially impair these resources under CEQA and to adversely affect the resources as defined by Section 106 of the NHPA. This effect would be adverse.

**CEQA Conclusion:** Construction of conveyance facilities would affect identified archaeological resources that occur in the footprint of this alternative. DWR has evaluated these resources and finds they are likely to qualify as historical resources under CEQA, as described in detail in Appendix 18B. This impact would be significant because construction could materially alter or destroy the potential of these resources to yield information useful in archaeological research, the basis for the significance of these resources, through excavation and disruption of the spatial associations that contain meaningful information. Mitigation Measure CUL-1a would reduce this impact, but would not guarantee that all of the scientifically important material would be retrieved because feasible archaeological excavation only typically retrieves a sample of the deposit, and portions of the site

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may remain after treatment with important information. Construction could damage these remaining portions of the deposit. Therefore, this impact is significant and unavoidable.

#### **Mitigation Measure CUL-1: Prepare a data recovery plan and perform data recovery excavations on the affected portion of the deposits of identified and significant archaeological sites**

Please refer to Mitigation Measure CUL-1 under Alternative 1A.

#### **Impact CUL-2: Effects on archaeological sites to be identified through future inventory efforts**

This impact is substantially similar to Impact CUL-2 described under Alternative 1A. While the intake locations would be reduced to three facilities, slightly reducing the potential for effects on archaeological resources, the overall potential for effects on archaeological resources is similar.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. The locations of various features such as intakes, forebays, and tunnels shaft locations are depicted in Figure M3-1 in the mapbook volume. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of these resources to yield data useful in research. While Mitigation Measure CUL-2 would reduce these effects, it cannot guarantee all effects would be avoided because relocation of proposed facilities to avoid all resources is unlikely. These effects would remain adverse.

**CEQA Conclusion:** The right-of-way for this alternative is sensitive for both prehistoric and historic-era resources that cannot be identified at this time because the much of the right-of-way is not legally accessible. Because many of these resources are likely to have data useful in prehistoric and historic archaeological research, as well as the integrity to convey this significance, they are likely to qualify as historical resources or unique archaeological sites under CEQA or historic properties under the Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of these resources by disrupting the spatial associations that could yield important data, resulting in a significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot guarantee that all eligible or significant resources would be preserved in place, or that all important data would be retrieved before construction destroys these resources. The scale of the BDCP, investment into existing designs, and the presence of other important environmental resources such as habitat, natural communities, and wetlands that should be avoided are constraints on the flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

#### **Mitigation Measure CUL-2: Conduct inventory, evaluation, and treatment of archaeological resources**

Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

#### **Impact CUL-3: Effects on archaeological sites that may not be identified through inventory efforts**

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This impact is substantially similar to Impact CUL-3 described under Alternative 1A. While the intake locations would be reduced to three facilities, slightly reducing the potential for effects on archaeological resources, and thus the overall potential for effects on archaeological resources that may not be identified through inventory is similar.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of these resources to yield data useful in research. Mitigation Measure CUL-3 would reduce these effects, but cannot guarantee that all effects would be avoided because inadvertent disturbance of some resources is inevitable given the scale of the proposed construction. These effects would therefore remain adverse.

**CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb previously unidentified archaeological sites qualifying as historical resources, historic properties, or unique archaeological resources. Because direct excavation, compaction, or other disturbance may disrupt the spatial associations that contain scientifically useful information it would alter the potential basis for eligibility, thus materially altering the resource and resulting in a significant effect. Because these resources would not be identified prior to construction, they cannot be recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-3 would reduce but not entirely avoid the potential for this impact, by implementing construction worker training, monitoring and discovery protocols. However, because archaeological resources may not be identified prior to disturbance through these measures, the effect cannot be entirely avoided. Therefore, this impact would remain significant and unavoidable.

#### **Mitigation Measure CUL-3: Implement an archaeological resources discovery plan, perform training of construction workers, and conduct construction monitoring**

Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

#### **Impact CUL-4: Effects on buried human remains damaged during construction**

The footprint of this alternative is sensitive for buried human remains that may occur in isolation, rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact mechanisms are substantially similar to the sensitivity and impact mechanisms described under Alternative 1A. While the intake locations would be reduced to three facilities, slightly reducing the potential for effects on buried human remains, the overall potential for effects on buried human remains is similar.

Ground disturbing construction has the potential to damage and disinter buried human remains, resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect remains adverse.

**CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human remains. Construction would likely result in disturbance of these features. Disturbance of human remains, including remains interred outside of cemeteries is considered a significant impact in the CEQA Appendix G checklist, therefore disturbance of these remains would result in a significant

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effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-significant level because mitigation would not guarantee that these features could be discovered and treated in advance of construction; the scale of construction makes it technically and economically infeasible to perform the level of sampling necessary to identify all such resources prior to construction. Therefore, this impact is considered significant and unavoidable.

#### **Mitigation Measure CUL-4: Follow state and federal law governing human remains if such resources are discovered during construction**

Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

#### **Impact CUL-5: Direct and indirect effects on identified historic architectural/built environment resources resulting from construction activities**

A total of thirty-three (33) resources would be affected by this alternative. A table of these properties, their attributes, and whether or not the impacts are direct or indirect can be found in Appendix 18B. These affected resources are substantially similar to the resources described in Alternative 1A, however the Hood Historic District, containing thirty-four (34) resources would not be affected. In addition, ten of the significant ranches/agricultural properties and rural single-family/multiple-family properties that would be affected by Alternative 1A would not be affected by Alternative 7; no additional significant ranches/agricultural properties and rural single-family/multiple-family properties not affected by Alternative 1A would be affected by Alternative 7. The bridge and five accessible islands would be affected by all alternatives under the tunnel option. These built resources include previously identified resources and resources newly identified resources that appear significant under the CRHR and NRHP for the same reasons described under Alternative 1A. These properties also retain enough integrity to convey their historic significance. The majority of these properties are located in the northern third of the alignment, near the intakes and the northern forebay.

#### **Anticipated Effects on Identified Resources**

Direct effects on identified resources associated with this alternative include demolition of these resources to place intakes, a forebay, transmission lines, tunnel muck work areas or other areas of surface impact, and concrete batch plants and fuel stations adjacent to the alignment. Direct effects may also occur through damage resulting from construction-generated vibration which can result in structural damage or foundation subsidence. Even if the resources can be avoided they may be subject to indirect effects resulting from permanent changes to the visual setting caused by construction of the nearby intakes, transmission lines, poles, and towers, pumping plants, or tunnel muck work areas if the soil is not removed upon the completion of construction and the land restored to its original condition. These new features would cause indirect effects because new facilities would be inconsistent with the rural feeling, setting, and association that contributes, in part, to the significance of these built environment cultural resources. These resources and the effect mechanism (direct or indirect) are provided in Appendix 18B. Facility redesign to avoid direct impacts on historic architectural resources is preferred as mitigation if possible. However, it is unlikely that all identified resources can be avoided because of the scale of the BDCP and the need to balance avoidance of other important environmental resources such as wetlands, natural communities, and special-status species habitat. These effects would materially impair the resources within the meaning of CEQA and result in adverse effects within the meaning of Section 106 because they would diminish the characteristics that convey the significance of the resources. Direct

demolition and indirect effects are likely to occur even with mitigation. Therefore, these effects would be adverse.

**CEQA Conclusion:** Thirty-three eligible and potentially eligible historic-era built environment resources have been identified in the footprint of this alternative. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

**Mitigation Measure CUL-5: Implement a built environment treatment plan, consult with relevant parties, and implement treatment**

Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

**Impact CUL-6: Direct and indirect effects on unidentified and unevaluated historic architectural/built environment resources resulting from construction activities**

The footprint of this alternative is sensitive for unidentified and unevaluated built environment resources that may have significance and integrity for the same reasons described under Alternative 1A. A total of 32 unevaluated built environment resources have been identified that may be subject to direct or indirect effects as a result of the construction of this alternative.

**Anticipated Effects**

Construction may result in direct demolition of these resources, damage through vibration, or indirect effects such as changes to the setting. While mitigation is available to reduce these effects, this mitigation cannot guarantee that all effects would be avoided because mitigation cannot guarantee that eligible resources would be avoided and that adverse changes to the setting would not occur. Construction has the potential to directly or indirectly damage built environment resources through demolition or introduction of new inconsistent features into the setting. These changes would impair the ability of the resources to convey their significance because the character defining elements or setting of the resource would be lost. Therefore, impacts on these resources may be adverse.

**CEQA Conclusion:** The BDCP area is sensitive for built environment resources that have not yet been recorded and evaluated because the majority of the BDCP area is legally inaccessible, and inventory efforts have not gathered information in these inaccessible areas. Many of these resources are likely to be associated with important historical themes or persons, or possess high creative values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of these resources remain intact and retain their rural agricultural setting they are also likely to have integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or historical resources under the NHPA and CEQA. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be

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material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

**Mitigation Measure CUL-6: Conduct a survey of inaccessible properties to assess eligibility, determine if these properties will be adversely impacted by the project, and include the treatment of these properties in the mitigation plans for known properties to resolve or mitigate adverse impacts.**

Please refer to Mitigation Measure CUL-6 under Alternative 1A.

#### **Impact CUL-7: Effects of conservation measures on cultural resources**

This impact describes the potential effects of other conservation measures at a program level of detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar to Impact CUL-7 as discussed under Alternative 1A because the nature of the affected resources, scope of activities, and geographic area of effects are generally similar. These measures would result in effects on cultural resources when ground-disturbing work is performed to construct improvements and enhance or restore natural communities. Direct effects would occur through demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic archaeological sites, unique archaeological sites, TCPs, human remains, and built environment resources. Indirect effects may occur where changes to the setting alter the existing setting in a manner that is inconsistent with the feeling and association of the resource. Because the ability of the resources to convey their significance would be lost this effect would materially alter these resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural landscapes that are converted to habitat may no longer convey the themes of agriculture and settlement, and thus would be inconsistent with remaining features associated with rural historic landscapes created by reclamation, cultivation, and ranching.

Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of land included in all conservation measures that would be implemented under this alternative, it is unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique archaeological sites could be avoided. Therefore, this impact would be adverse.

**CEQA Conclusion:** Construction and implementation of conservation measures would result in ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and built environment resources such as historic architectural structures and rural historic landscapes. The same construction may damage unique archaeological sites. This construction would likely result in materially adverse changes for the following reasons:

- ground disturbing construction in archaeological sites disrupts the spatial associations that contain data useful in research, thus diminishing or destroying the basis for the significance of the resource, and;

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- ground disturbing construction may either directly demolish or indirectly affect the setting of built environment resources, resulting in an inability of the resource to convey its significance, and;
- ground disturbing construction may either directly demolish or change the setting of traditional cultural properties resulting in an inability of the resource to convey its significance.
- ground disturbing construction may inadvertently disturb human remains.

The alteration of a resource that changes the characteristics that convey its significance is a material alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under CEQA under the Appendix G checklist. Because this construction would materially alter these categories of resources and disturb human remains it would result in a significant impact. Mitigation is available to reduce these impacts by identifying and evaluating resources, avoiding resources where possible, and developing treatment where avoidance is not possible. In addition construction would be monitored. However, because of the acreage associated with the proposed restoration under conservation measures, as well as the multiple constraints associated with other environmental resources that require mitigation or avoidance, it is unlikely that all cultural resources could be avoided. Therefore, this impact remains significant and unavoidable.

#### **Mitigation Measure CUL-7: Conduct cultural resource studies and adopt cultural resource mitigation measures for cultural resource impacts associated with conservation component implementation**

Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A

#### **Impact CUL-8: Compatibility of the proposed water conveyance facilities and other conservation measures with plans and policies**

Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could result in the potential for incompatibilities with plans and policies adopted to protect the cultural resources of the Delta. A number of plans and policies that coincide with the study area provide guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether Alternative 7 is compatible or incompatible with these policies, rather than whether impacts are adverse or not adverse or significant or less than significant. Because Alternative 7 would result in the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the BDCP will be compatible with these policies because significant cultural resources will be avoided where feasible, and mitigation will be implemented to reduce effects where avoidance and preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

**CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by the various counties with jurisdiction in this region. For policies that emphasize preservation or



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mitigation the BDCP will be compatible with these policies because DWR and Reclamation will implement cultural resource management practices that will identify significant resources, preserve such resources where feasible, and complete mitigation to reduce significant effects where preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

### **18.3.5.15 Alternative 8—Dual Conveyance with Pipeline/Tunnel, Intakes 2, 3, and 5, and Increased Delta Outflow (9,000 cfs; Operational Scenario F)**

#### **Impact CUL-1: Effects on identified archaeological sites resulting from construction of conveyance facilities**

##### **Identified Resources**

Record searches at the CHRIS and inventory efforts have identified previously recorded prehistoric archaeological sites in the footprint of this alternative: CA-Sac-56, CA-Sac-57, CA-Sac-59, and CA-Sac-65/H. Record searches also identified an historic archaeological site, CA-SJO-220H, in the footprint of this alternative. Detailed site descriptions summarizing available information regarding these resources, are provided in Appendix 18B.

The resources are distributed evenly across the alignment, but are somewhat clustered where construction of large above-ground features would occur, such as the northern end of the alignment, at the intermediate forebay, and at the southern end of the alignment.

##### **Significance of Identified Prehistoric and Historic Resources**

The resources affected by this alternative have likely have significance and integrity within the meaning of the NRHP and CRHR for the same reasons described above under Alternative 1A.

##### **Anticipated Effects on Identified Resources**

Ground-disturbing construction is likely to disturb the deposits and thus materially their ability to convey their significance. Much of the data potential in archaeological resources exists in the spatial associations of different artifacts and other cultural material. Where artifacts that have known associations with particular time periods occur adjacent to other material such as faunal bone or plant remains from subsistence activity, the proximity of the materials allows an inference as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence strategies during different prehistoric periods. Intrusive ground-disturbing construction may disrupt these associations and thus disrupt the qualities for which the sites qualify as historical resources. For these reasons, construction has the potential to materially impair these resources under CEQA and to adversely affect the resources as defined by Section 106 of the NHPA. This effect would be adverse.

**CEQA Conclusion:** Construction of conveyance facilities would affect identified archaeological resources that occur in the footprint of this alternative. DWR has evaluated these resources and finds they are likely to qualify as historical resources under CEQA, as described in detail in Appendix 18B. This impact would be significant because construction could materially alter or destroy the potential of these resources to yield information useful in archaeological research, the basis for the significance of these resources, through excavation and disruption of the spatial associations that contain meaningful information. Mitigation Measure CUL-1a would reduce this impact, but would not guarantee that all of the scientifically important material would be retrieved because feasible archaeological excavation only typically retrieves a sample of the deposit, and portions of the site may remain after treatment with important information. Construction could damage these remaining portions of the deposit. Therefore, this impact is significant and unavoidable.

**Mitigation Measure CUL-1: Prepare a data recovery plan and perform data recovery excavations on the affected portion of the deposits of identified and significant archaeological sites**

Please refer to Mitigation Measure CUL-1 under Alternative 1A.

**Impact CUL-2: Effects on archaeological sites to be identified through future inventory efforts**

This impact is substantially similar to Impact CUL-2 described under Alternative 1A. While the intake locations would be reduced to three facilities, slightly reducing the potential for effects on archaeological resources that have yet to be identified, the overall potential for effects on these kinds of resources is similar.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. The locations of various features such as intakes, forebays, and tunnels shaft locations are depicted in Figure M3-1 in the mapbook volume. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of these resources to yield data useful in research. While Mitigation Measure CUL-2 would reduce these effects, it cannot guarantee all effects would be avoided because relocation of proposed facilities to avoid all resources is unlikely. These effects would remain adverse.

**CEQA Conclusion:** The right-of-way for this alternative is sensitive for both prehistoric and historic-era resources that cannot be identified at this time because much of the right-of-way is not legally accessible. Because many of these resources are likely to have data useful in prehistoric and historic archaeological research, as well as the integrity to convey this significance, they are likely to qualify as historical resources or unique archaeological sites under CEQA or historic properties under the Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of these resources by disrupting the spatial associations that could yield important data, resulting in a significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot guarantee that all eligible or significant resources would be preserved in place, or that all important data would be retrieved before construction destroys these resources. The scale of the BDCP, investment into existing designs, and the presence of other important environmental resources such as habitat, natural communities, and wetlands that should be avoided are constraints

on the flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

**Mitigation Measure CUL-2: Conduct inventory, evaluation, and treatment of archaeological resources**

Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

**Impact CUL-3: Effects on archaeological sites that may not be identified through inventory efforts**

This impact is substantially similar to Impact CUL-3 described under Alternative 1A. While the intake locations would be reduced to three facilities, slightly reducing the potential for effects on archaeological resources, and thus the overall potential for effects on archaeological resources is similar.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of these resources to yield data useful in research. Mitigation Measure CUL-3 would reduce these effects, but cannot guarantee that all effects would be avoided because inadvertent disturbance of some resources is inevitable given the scale of the proposed construction. These effects would therefore remain adverse.

**CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb previously unidentified archaeological sites qualifying as historical resources, historic properties, or unique archaeological resources. Because direct excavation, compaction, or other disturbance may disrupt the spatial associations that contain scientifically useful information it would alter the potential basis for eligibility, thus materially altering the resource and resulting in a significant effect. Because these resources would not be identified prior to construction, they cannot be recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-3 would reduce but not entirely avoid the potential for this impact, by implementing construction worker training, monitoring and discovery protocols. However, because archaeological resources may not be identified prior to disturbance through these measures, the effect cannot be entirely avoided. Therefore, this impact would remain significant and unavoidable.

**Mitigation Measure CUL-3: Implement an archaeological resources discovery plan, perform training of construction workers, and conduct construction monitoring**

Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

**Impact CUL-4: Effects on buried human remains damaged during construction**

The footprint of this alternative is sensitive for buried human remains that may occur in isolation, rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact mechanisms are substantially similar to the sensitivity and impact mechanisms described under Alternative 1A. While the intake locations would be reduced to three facilities, slightly reducing the

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potential for effects on buried human remains, the overall potential for effects on buried human remains is similar.

Ground disturbing construction has the potential to damage and disinter buried human remains, resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect remains adverse.

**CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human remains. Construction would likely result in disturbance of these features. Disturbance of human remains, including remains interred outside of cemeteries is considered a significant impact in the CEQA Appendix G checklist, therefore disturbance of these remains would result in a significant effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-significant level because mitigation would not guarantee that these features could be discovered and treated in advance of construction; the scale of construction makes it technically and economically infeasible to perform the level of sampling necessary to identify all such resources prior to construction. Therefore, this impact is considered significant and unavoidable.

#### **Mitigation Measure CUL-4: Follow state and federal law governing human remains if such resources are discovered during construction**

Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

#### **Impact CUL-5: Direct and indirect effects on identified historic architectural/built environment resources resulting from construction activities**

A total of thirty (30) built environment resources would be affected by this alternative. A table of these historically significant properties, their attributes, and whether or not the impacts are direct or indirect can be found in Appendix 18B. These affected resources are substantially similar to the resources described in Alternative 1A, however the Hood Historic District, containing thirty-four (34) resources would not be affected. In addition, thirteen of the significant ranches/agricultural properties and rural single-family/multiple-family properties that would be affected by Alternative 1A would not be affected by Alternative 8; no additional significant ranches/agricultural properties and rural single-family/multiple-family properties not affected by Alternative 1A would be affected by Alternative 8. The bridge and five accessible islands would be affected by all alternatives under the tunnel option. These built resources include previously identified resources and resources newly determined to appear eligible because they meet the significance criteria in the NRHP and CRHR for the same reasons described under Alternative 1A. These properties also retain enough integrity to convey their historic significance because the setting and character defining elements of these properties remain largely intact. The majority of these properties are located in the northern third of the alignment, near the intakes and the northern forebay.

#### **Anticipated Effects on Identified Resources**

Direct effects on identified resources associated with this alternative include demolition of these resources to place intakes, a forebay, transmission lines, tunnel muck work areas, and concrete batch plants and fuel stations adjacent to the alignment. Direct effects may also occur through damage resulting from construction-generated vibration which can result in structural damage or foundation subsidence. Even if the resources can be avoided they may be subject to indirect effects resulting from permanent changes to the visual setting caused by construction of the nearby intakes,

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transmission lines, poles and towers, pumping plants, or tunnel muck work areas if the soil is not removed upon the completion of construction and the land restored to its original condition. These new features would cause indirect effects because new facilities would be inconsistent with the rural feeling, setting, and association that contributes, in part, to the significance of these built environment cultural resources. These resources and the effect mechanism (direct or indirect) are provided in Appendix 18B. Facility redesign to avoid direct impacts on historic architectural resources is preferred as mitigation if possible. However, it is unlikely that all identified resources can be avoided because of the scale of the BDCP and the need to balance avoidance of other important environmental resources such as wetlands, natural communities, and special-status species habitat. These effects would materially impair the resources within the meaning of CEQA and result in adverse effects within the meaning of Section 106 because they would diminish the characteristics that convey the significance of the resources. Direct demolition and indirect effects are likely to occur even with mitigation. Therefore, these effects would be adverse.

**CEQA Conclusion:** Thirty eligible and potentially eligible historic-era built environment resources have been identified in the footprint of this alternative. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

#### **Mitigation Measure CUL-5: Implement a built environment treatment plan, consult with relevant parties, and implement treatment**

Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

#### **Impact CUL-6: Direct and indirect effects on unidentified and unevaluated historic architectural/built environment resources resulting from construction activities**

The footprint of this alternative is sensitive for unidentified and unevaluated built environment resources that may have significance and integrity for the same reasons described under Alternative 1A. A total of 32 unevaluated built environment resources have been identified that may be subject to direct or indirect effects as a result of the construction of this alternative.

#### **Anticipated Effects**

Construction may result in direct demolition of these resources, damage through vibration, or indirect effects such as changes to the setting. While mitigation is available to reduce these effects, this mitigation cannot guarantee that all effects would be avoided because mitigation cannot guarantee that eligible resources would be avoided and that adverse changes to the setting would not occur. Construction has the potential to directly or indirectly damage built environment resources through demolition or introduction of new inconsistent features into the setting. These changes would impair the ability of the resources to convey their significance because the character defining elements or setting of the resource would be lost. Therefore, impacts on these resources may be adverse.

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**CEQA Conclusion:** The BDCP area is sensitive for built environment resources that have not yet been recorded and evaluated because the majority of the BDCP area is legally inaccessible, and inventory efforts have not gathered information in these inaccessible areas. Many of these resources are likely to be associated with important historical themes or persons, or possess high creative values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of these resources remain intact and retain their rural agricultural setting they are also likely to have integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or historical resources under the NHPA and CEQA. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

**Mitigation Measure CUL-6: Conduct a survey of inaccessible properties to assess eligibility, determine if these properties will be adversely impacted by the project, and include the treatment of these properties in the mitigation plans for known properties to resolve or mitigate adverse impacts.**

Please refer to Mitigation Measure CUL-6 under Alternative 1A.

#### **Impact CUL-7: Effects of conservation measures on cultural resources**

This impact describes the potential effects of other conservation measures at a program level of detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar to Impact CUL-7 as discussed under Alternative 1A because the nature of the affected resources, scope of activities, and geographic area of effects are generally similar. These measures would result in effects on cultural resources when ground-disturbing work is performed to construct improvements and enhance or restore natural communities. Direct effects would occur through demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic archaeological sites, unique archaeological sites, TCPs, human remains, and built environment resources. Indirect effects may occur where changes to the setting alter the existing setting in a manner that is inconsistent with the feeling and association of the resource. Because the ability of the resources to convey their significance would be lost this effect would materially alter these resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural landscapes that are converted to habitat may no longer convey the themes of agriculture and settlement, and thus would be inconsistent with remaining features associated with rural historic landscapes created by reclamation, cultivation, and ranching.

Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of land included in all conservation measures that would be implemented under this alternative, it is unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique archaeological sites could be avoided. Therefore, this impact would be adverse.

**CEQA Conclusion:** Construction and implementation of conservation measures would result in ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and built environment resources such as historic architectural structures and rural historic landscapes. The same construction may damage unique archaeological sites. This construction would likely result in materially adverse changes for the following reasons:

- ground disturbing construction in archaeological sites disrupts the spatial associations that contain data useful in research, thus diminishing or destroying the basis for the significance of the resource, and;
- ground disturbing construction may either directly demolish or indirectly affect the setting of built environment resources, resulting in an inability of the resource to convey its significance, and;
- ground disturbing construction may either directly demolish or change the setting of traditional cultural properties resulting in an inability of the resource to convey its significance.
- ground disturbing construction may inadvertently disturb human remains.

The alteration of a resource that changes the characteristics that convey its significance is a material alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under CEQA under the Appendix G checklist. Because this construction would materially alter these categories of resources and disturb human remains it would result in a significant impact. Mitigation is available to reduce these impacts by identifying and evaluating resources, avoiding resources where possible, and developing treatment where avoidance is not possible. In addition construction would be monitored. However, because of the acreage associated with the proposed restoration under conservation measures, as well as the multiple constraints associated with other environmental resources that require mitigation or avoidance, it is unlikely that all cultural resources could be avoided. Therefore, this impact remains significant and unavoidable.

**Mitigation Measure CUL-7: Conduct cultural resource studies and adopt cultural resource mitigation measures for cultural resource impacts associated with conservation component implementation**

Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A

**Impact CUL-8: Compatibility of the proposed water conveyance facilities and other conservation measures with plans and policies**

Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could result in the potential for incompatibilities with plans and policies adopted to protect the cultural resources of the Delta. A number of plans and policies that coincide with the study area provide guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether Alternative 8 is compatible or incompatible with these policies, rather than whether impacts are adverse or not adverse or significant or less than significant. Because Alternative 8 would result in the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the

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BDCP will be compatible with these policies because significant cultural resources will be avoided where feasible, and mitigation will be implemented to reduce effects where avoidance and preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

**CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by the various counties with jurisdiction in this region. For policies that emphasize preservation or mitigation the BDCP will be compatible with these policies because DWR and Reclamation will implement cultural resource management practices that will identify significant resources, preserve such resources where feasible, and complete mitigation to reduce significant effects where preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

### 18.3.5.16 Alternative 9—Through Delta/Separate Corridors (15,000 cfs; Operational Scenario G)

#### Impact CUL-1: Effects on identified archaeological sites resulting from construction of conveyance facilities

##### Identified Resources

Record searches at the CHRIS and inventory efforts have identified previously recorded prehistoric archaeological sites in the footprint of this alternative: CA-Sac-47 and CA-Sac-249. CA-Sac-47 was recorded by Dr. Franklin Fenenga. The site record was likely recorded prior to 1950, judging by the relatively early number in the numbering sequence. The site measures 91 meters by 30 meters. No description of the cultural constituents is provided on the site record, except a note indicating that the artifacts were “brought to museum by Heizer and Fenenga.” CA-Sac-249 was recorded in 1962, with no subsequent update to the site record. The site measures approximately 12 meters by 3 meters. The site record indicates that the site contains shell, bone, burnt clay objects.

##### Significance of Identified Prehistoric and Historic Resources

The deposit recorded at CA-Sac-49 likely contains significant material in archaeological research because the record indicates that some of the cultural constituents were removed to a museum by the original parties that recorded the site. Furthermore, the sequential number (“49”) indicates the site was among the first recorded in Sacramento County. Early archaeological efforts focused on salvaging important sites, particularly notable sites that had the potential for destruction or loss. These facts suggest the inference that CA-Sac-49 contains a cultural assemblage that is notable or useful in research. The deposit at CA-Sac-249 contains shell, bone and burnt clay objects. These materials consist of habitation debris and datable organic material. Because these materials and



deposits may yield information useful in prehistoric research they likely have significance under the fourth criterion for the CRHR and the NRHP. If these sites retain sufficient integrity to convey this significance they may qualify as historical resources or historic properties.

### **Anticipated Effects on Identified Resources**

The exact location of these resources cannot be disclosed because such disclosure might allow looters to find the sites on the ground and remove archaeological material. However CA-Sac-47 occurs near a potential work area. If the site boundaries extend into the work area, ground-disturbing construction, staging, or other activity may damage this resource. The mapped location of CA-Sac-249 coincides with the footprint of proposed channel enlargement. Ground disturbing construction may thus damage this resource.

Much of the data potential in archaeological resources exists in the spatial associations of different artifacts and other cultural material. Where artifacts that have known associations with particular time periods occur adjacent to other material such as faunal bone or plant remains from subsistence activity, the proximity of the materials allows an inference as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence strategies during different prehistoric periods. Intrusive ground-disturbing construction may disrupt these associations and thus disrupt the qualities for which the sites qualify as historical resources. For these reasons, construction has the potential to materially impair these resources under CEQA and to adversely affect the resources as defined by Section 106 of the NHPA. This effect would be adverse.

**CEQA Conclusion:** Construction of conveyance facilities would affect identified archaeological resources that occur in the footprint of this alternative. DWR has evaluated these resources and finds they are likely to qualify as historical resources under CEQA, as described in detail in Appendix 18B. This impact would be significant because construction could materially alter or destroy the potential of these resources to yield information useful in archaeological research, the basis for the significance of these resources, through excavation and disruption of the spatial associations that contain meaningful information. Mitigation Measure CUL-1a would reduce this impact, but would not guarantee that all of the scientifically important material would be retrieved because feasible archaeological excavation only typically retrieves a sample of the deposit, and portions of the site may remain after treatment with important information. Construction could damage these remaining portions of the deposit. Therefore, this impact is significant and unavoidable.

### **Mitigation Measure CUL-1: Prepare a data recovery plan and perform data recovery excavations on the affected portion of the deposits of identified and significant archaeological sites**

### **Impact CUL-2: Effects on archaeological sites to be identified through future inventory efforts**

An inventory for the majority of the right-of-way for this alternative has not been conducted because the right-of-way is not currently legally accessible [Appendix xxx, being prepared by RMM LLP]. Because several prehistoric archaeological sites qualifying as historical resources have been identified in the footprint of this alternative, the remaining portion of the right-of-way for this conveyance feature is sensitive for previously unidentified archaeological resources. Record searches at the North Central Information Center reviewed the mapped location of previous cultural resource inventories in the footprint of this alternative and the vicinity. This map review revealed that a cultural resources inventory has never been conducted in the majority of the footprint for

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alternative. The presence of three archaeological sites that qualify as historical resources and historic properties in the portion of the footprint that has been previously inspected provides a sample of the likely density and occurrence of resources in the remaining right-of-way. For this reason, additional prehistoric archaeological resources are likely to be found in the portion of the right-of-way where surveys have not been conducted, once access is available and such studies can be completed.

In addition to prehistoric archaeological resources, the BDCP area is sensitive for historic-era archaeological resources. While record searches revealed no recorded historic-era archaeological resources in the right-of-way, it is likely that previously unidentified historic archaeological sites occur in the footprint of this alternative because of the intensity of human activity in the Plan Area during the historic era, as described in Section 18.1.6, *Historic-Era Setting*.

Prehistoric sites in the Plan Area tend to be large and rich in material remains, including human burials and associated ornaments and beads. Habitation debris also often contains both floral and faunal material that can be used for both radiocarbon dating and analysis regarding subsistence strategies. In addition, the large scale of typical prehistoric archaeological resources suggests portions of these deposits will remain with sufficient integrity to convey research information. Therefore, these sites are likely to qualify as historical resources or unique archaeological resources under CEQA and historic properties under Section 106 of the NHPA.

Historic sites are likely to be associated with the historic-era themes of settlement, reclamation, agriculture, and flood management in the Delta region. Because the reclamation and agricultural development of the Delta region provided part of the economic base for the development of surrounding urban centers, these historic themes are significant at both a state and national level. In addition, the intensity of historic activity in the Delta region suggests that many of these resources are likely to retain sufficient integrity to convey this significance. Therefore, these sites are likely to qualify as historical resources or unique archaeological resources under CEQA and historic properties under Section 106 of the NHPA.

Absent mitigation, ground-disturbing construction is likely to physically damage many of these resources by disrupting the spatial associations that convey data useful in research or changing the setting such that the resource no longer contains its significance. The locations of ground disturbing features such as borrow and spoil areas, control structures, and pumping plants are depicted in Figure M3-4 in the mapbook volume. These impacts would thus materially impair these resources within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA. These effects would be adverse.

**CEQA Conclusion:** The right-of-way for this alternative is sensitive for both prehistoric and historic-era resources that cannot be identified at this time because the much of the right-of-way is not legally accessible. Because many of these resources are likely to have data useful in prehistoric and historic archaeological research, as well as the integrity to convey this significance, they are likely to qualify as historical resources or unique archaeological sites under CEQA or historic properties under the Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of these resources by disrupting the spatial associations that could yield important data, resulting in a significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot guarantee that all eligible or significant resources would be preserved in place, or that all important data would be retrieved before construction destroys these resources. The scale of the BDCP, investment into existing designs, and the presence of other important environmental

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resources such as habitat, natural communities, and wetlands that should be avoided are constraints on the flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

#### **Mitigation Measure CUL-2: Conduct inventory, evaluation, and treatment of archaeological resources**

Please refer to Mitigation Measure CUL-2 for Alternative 1A, above.

#### **Impact CUL-3: Effects on archaeological sites that may not be identified through inventory efforts**

Because several archaeological sites qualifying as historical resources have been identified in the footprint of this alternative, the remaining portion of the right-of-way for this conveyance feature is sensitive for previously unidentified prehistoric archaeological resources. While surveys will be completed for the right-of-way, once access is available, such surveys cannot guarantee that all sites will be identified prior to construction. The rapid rate of at which alluvium and sediment accumulates in the Delta region, and the geologically unstable nature of the floodplain and riverbank environments in which these resources may occur makes it likely that numerous sites occur capped below surface soils. Cultural resource inventory efforts cannot always identify such resources, even with intermittent surface excavation designed to reveal sites with little or no surface manifestation because exhaustive sampling to identify every resource is economically and technically infeasible. These sites may also occur buried at the depth at which tunnel boring operations would be performed.

Many of these unidentified prehistoric resources are likely to qualify as historical resources, historic properties, or unique archaeological resources because prehistoric sites in the Delta region tend to be large and contain a rich material culture. In particular, burial features tend to be associated with numerous shell ornaments, charmstones, and associated grave goods. Habitation components often contain abundant faunal and floral remains that elucidate prehistoric adaptations such as subsistence methods.

In addition to prehistoric archaeological resources, the BDCP area is sensitive for historic-era archaeological resources. Archaeological debris found in historic era archaeological sites activity is likely to be associated with significant themes such as agriculture, reclamation, and settlement of the Delta region. The size of the BDCP area and the intensity of historic activity suggest that some of these resources will qualify as historical resources, historic properties, or unique archaeological resources.

Ground disturbing work may disturb and damage these resources before they can be identified and avoided during monitoring efforts required under Mitigation Measure CUL-3. This damage and disturbance may materially impair these resources within the meaning of CEQA or adversely affect the resources within the meaning of Section 106 because this disturbance would impair the ability of these resources to yield data useful in research. While Mitigation Measure CUL-3 would reduce the potential for this impact, it would not guarantee the impact would be avoided entirely. Therefore, this impact is adverse.

**CEQA Conclusion: CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb previously unidentified archaeological sites qualifying as historical resources, historic properties, or unique archaeological resources. Because direct excavation, compaction, or

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other disturbance may disrupt the spatial associations that contain scientifically useful information it would alter the potential basis for eligibility, thus materially altering the resource and resulting in a significant effect. Because these resources would not be identified prior to construction, they cannot be recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-3 would reduce but not entirely avoid the potential for this impact, by implementing construction worker training, monitoring and discovery protocols. However, because archaeological resources may not be identified prior to disturbance through these measures, the effect cannot be entirely avoided. Therefore, this impact would remain significant and unavoidable.

#### **Mitigation Measure CUL-3: Implement an archaeological resources discovery plan, perform training of construction workers, and conduct construction monitoring**

Please refer to Mitigation Measure CUL-3, above, for Alternative 1A.

#### **Impact CUL-4: Effects on buried human remains damaged during construction**

The footprint of this alternative is sensitive for buried human remains that may occur in isolation, rather than as part of prehistoric or historic archaeological sites. Historic and prehistoric human remains have been discovered as isolated interments rather than as part of larger sites. Because these isolated resources are not associated with larger deposits, their distribution and depth cannot be estimated. Construction of this alternative would require ground disturbing work that may damage previously unidentified human remains, resulting in direct effects on these resources. While inventory and monitoring efforts are prescribed above under Mitigation Measures CUL-2 and CUL-3, the large acreages subject to disturbance under this alternative make exhaustive sampling to identify all buried and isolated human remains technically and economically infeasible. For these reasons the potential remains that such resources may be damaged before they can be discovered through inventory or monitoring. This effect would be adverse.

**CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human remains. Construction would likely result in disturbance of these features. Disturbance of human remains, including remains interred outside of cemeteries is considered a significant impact in the CEQA Appendix G checklist, therefore disturbance of these remains would result in a significant effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-significant level because mitigation would not guarantee that these features could be discovered and treated in advance of construction; the scale of construction makes it technically and economically infeasible to perform the level of sampling necessary to identify all such resources prior to construction. Therefore, this impact is considered significant and unavoidable.

#### **Mitigation Measure CUL-4: Follow state and federal law governing human remains if such resources are discovered during construction**

Please refer to Mitigation Measure CUL-4, above, for Alternative 1A.

#### **Impact CUL-5: Direct and indirect effects on identified and potentially eligible historic architectural/built environment resources resulting from construction activities**

Approximately 146 built environment resources that have appear NRHP and CRHR-eligible occur in the footprint of this alternative and would be adversely affected by this alternative. These built

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resources include previously identified resources and resources newly determined to appear eligible because they meet the criteria in the NRHP regulations (36 CFR 60.4). These properties also retain enough integrity to convey their historic significance because their character defining features are sufficiently intact and the setting is relatively unaltered in comparison to the setting's condition during the period of significance.

The following summary discusses the basis for potential eligibility as well as the nature of potential effects for these resources. Many potentially eligible resources are significant under the first NRHP and CRHR criterion because of their association with events that have made a significant contribution to the development of the Delta. Individual significance themes that are relevant to broad patterns of history and heritage include:

- land reclamation and flood management structures;
- early settlement represented by residences and communities, including concentrated settlement of ethnic groups, such as Chinese, Japanese, Filipino, and Portuguese;
- early settlement that represents a town's growth as the commercial or manufacturing/processing focus of the surrounding agricultural area;
- early produce processing plants;
- early agricultural properties that may include a residence or multiple residences, barns, worker housing, ancillary buildings, planted acreage and associated irrigation systems; and;
- transportation infrastructure such as bridges, ferries, roads and trains, that enabled produce to get to market.

The following discussion summarizes resources that are eligible under the first NRHP and CRHR criterion:

- The Locke Historic District, listed on the National Register of Historic Places, covers about fourteen acres and includes fifty-three buildings, mostly constructed in 1916 by Chungshan Chinese immigrants who settled there after a 1915 fire that destroyed their homes in Walnut Grove. Virtually no new construction has taken place in Locke since the 1920s.
- The Walnut Grove Japanese/American Historic District is also listed on the National Register of Historic Places. It encompasses five acres and contains twenty-seven buildings that make up the Japanese-American commercial section of Walnut Grove. The buildings, mostly two-stories high, have over-hanging balconies, recessed entryways and storefront windows. Residences are on the second floor. Community gardens are interspersed on empty lots throughout the district.
- The Walnut Grove Chinese/American Historic District is also listed on the National Register of Historic Places. It covers about four acres and was built between 1937 and 1940. The twenty-two buildings were primarily built in Art/Moderne/Modernistic style of stucco with ceramic tiled fronts and false-front facades and are embellished with features typically Chinese in style.
- The Walnut Grove Commercial Historic District is also listed on the National Register of Historic Places. It encompasses about five acres and is associated with Alex Brown, an entrepreneur who constructed and used most of the eighteen buildings. It includes a town hall, bank, butcher shop and house in the Neoclassical style, a general merchandise store and a residence in the Craftsman style. The remaining buildings are small cottages of Craftsman, Neoclassical, and Colonial Revival styles built by Brown between 1918 and 1923 and was the first subdivision in

town that served as rental cottages for the Anglo workers in this predominantly Asian community.

- This alternative crosses eighteen islands or reclamation districts, the majority of which were established in the late 19th century. These resources are significant for their association with the historical themes of the reclamation and agricultural development of the Delta. While associated water-control features, such as the levees, weirs, pumps and pump houses have been necessarily updated and maintained, the integrity of land use on these islands is high and has changed little since they were established. All of these islands would be directly affected by this alternative. These properties are also significant for their engineered and design characteristics (the third NRHP and CRHR eligibility criterion).
- Six significant ranches/agricultural properties and rural single-family/multiple-family properties will be either directly or indirectly impacted. For the large ranch/agricultural properties, this alternative avoids many of the buildings associated with these properties, impacting only the agricultural land. This is still considered a direct impact because the agricultural land is a character-defining feature of this kind of property. Indirect affects occur when the alternative impacts adjacent property, diminishing historic integrity of the eligible property by altering its visual setting, feeling, and character. Rural single-family and multiple-family properties are made up of Delta-style houses, other rural homes at least 45 years old, and grand river-front homes. Again, as with the ranches/agricultural properties, these homes will be either directly impacted by this alternative or indirectly impacted by alteration of the setting, which is a character-defining feature of this kind of resource.

One property, Bacon Island, is significant for its association with George Shima, and thus is significant under the second NRHP and CRHR eligibility criterion. George Shima was a Japanese national that was responsible for much of the agricultural activity in the Delta between 1902 and 1925.

Several resources within this alignment are significant because they embody design characteristics distinctive to properties found in the Delta and thus are potentially eligible under the third NRHP and CRHR eligibility criterion. These features include levees and water conveyance systems, and bridges that represent technological advances; large agricultural properties that include grand residences, a distinctive barn, and landscaping that represent particular styles of architecture or landscaping; and the modest 19th-century/early 20th-century Delta-style houses built with the main entrance on the second floor in response to historically frequent flooding. Properties that only achieve significance under this criterion include:

- Twelve significant ranches/agricultural properties and rural single-family/multiple-family properties will be either directly or indirectly impacted. For the large ranch/agricultural properties, this alternative avoids many of the buildings associated with these properties, impacting only the agricultural land. This is still considered a direct impact because the agricultural land is a character-defining feature of this kind of property. Indirect affects occur when the alternative impacts adjacent property, diminishing historic integrity of the eligible property by altering its visual setting, feeling, and character.
- Rural single-family and multiple-family properties are made up of Delta-style houses, other rural homes at least 45 years old, and grand river-front homes. Again, as with the ranches/agricultural properties, these homes will be either directly impacted by this alternative or indirectly impacted by alteration of the setting, which is a character-defining feature of this kind of resource.

### **Anticipated Effects on Identified Resources**

Direct effects on identified resources associated with this alternative would result from construction of borrow areas, temporary work areas, short canal segments, and spoil disposal areas. These new features would also cause indirect effects because new facilities would be inconsistent with the rural feeling of the setting that likely contributes, in part, to the significance of these built environment cultural resources. Direct effects may also occur through damage resulting from construction generated vibration. These resources and the effect mechanism (direct or indirect) are provided in Appendix 18B. Facility redesign to avoid direct impacts on historic architectural resources is preferred as mitigation if possible. However, it is unlikely that all identified resources can be avoided because of the scale of the BDCP and the need to balance avoidance of other important environmental resources such as wetlands, natural communities, and special-status species habitat. These effects would materially impair the resources within the meaning of CEQA and result in adverse effects within the meaning of Section 106 because they would diminish the characteristics that convey the significance of the resources. Direct demolition and indirect effects are likely to occur even with mitigation. Therefore, these effects would be adverse.

**CEQA Conclusion:** Several identified historic-era built environment resources have been identified in the footprint of this alternative. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

#### **Mitigation Measure CUL-5: Implement a built environment treatment plan, consult with relevant parties, and implement treatment**

Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A

#### **Impact CUL-6: Direct and indirect effects on unidentified and unevaluated historic architectural/built environment resources resulting from construction activities**

The footprint of this alternative is sensitive for unidentified and unevaluated built environment resources that may have significance and integrity for the same reasons described under Alternative 1A. A total of 32 unevaluated built environment resources have been identified that may be subject to direct or indirect effects as a result of the construction of this alternative.

### **Anticipated Effects**

Construction may result in direct demolition of these resources, damage through vibration, or indirect effects such as changes to the setting. While mitigation is available to reduce these effects, this mitigation cannot guarantee that all effects would be avoided because mitigation cannot guarantee that eligible resources would be avoided and that adverse changes to the setting would not occur. Construction has the potential to directly or indirectly damage built environment resources through demolition or introduction of new inconsistent features into the setting. These changes would impair the ability of the resources to convey their significance because the character

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defining elements or setting of the resource would be lost. Therefore, impacts on these resources may be adverse.

**CEQA Conclusion:** The BDCP area is sensitive for built environment resources that have not yet been recorded and evaluated because the majority of the BDCP area is legally inaccessible, and inventory efforts have not gathered information in these inaccessible areas. Many of these resources are likely to be associated with important historical themes or persons, or possess high creative values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of these resources remain intact and retain their rural agricultural setting they are also likely to have integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or historical resources under the NHPA and CEQA. Construction of conveyance facilities may require demolition of the historic built-environment resources. Construction may also result in permanent indirect effects such as changes to the setting. Direct demolition or changes to the setting would be material alterations because they would either remove the resource or alter the resource character, resulting in an inability of the resource to convey its significance. For these reasons this would be a significant effect. Mitigation described below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of the BDCP and the constraints imposed by other environmental resources make avoidance of all significant effects unlikely. For these reasons this impact remains significant and unavoidable even with implementation of the following mitigation measures.

**Mitigation Measure CUL-6: Conduct a survey of inaccessible properties to assess eligibility, determine if these properties will be adversely impacted by the project, and include the treatment of these properties in the mitigation plans for known properties to resolve or mitigate adverse impacts.**

Please refer to Mitigation Measure CUL-6 under Alternative 1A.

#### **Impact CUL-7: Effects of conservation measures on cultural resources**

This impact describes the potential effects of other conservation measures at a program level of detail, with the exception of *CM1 Water Facilities and Operation*. The following conservation measures would not result in impacts on cultural resources because they consist of changes to existing activities, or planning and regulatory actions that do not have the potential to result in ground-disturbing work with effects on cultural resources.

- *CM11: Natural Communities Enhancement and Management*
- *CM12: Methylmercury Management*
- *CM13: Invasive Aquatic Vegetation Control*
- *CM14: Stockton Deep Water Ship Channel Dissolved Oxygen Levels*
- *CM15: Predator Control*
- *CM16: Nonphysical Fish Barriers*
- *CM17: Illegal Harvest Reduction*
- *CM19: Urban Stormwater Treatment*
- *M 20: Recreational Users Invasive Species Program*
- *CM21: Nonproject Diversions*



- *CM22: Avoidance and Minimization Measures*

Implementation of the remaining conservation measures could result in effects on prehistoric and historic archaeological resources, as well as TCPs and the built environment because the scope of conservation actions includes large areas of land, and the areas identified for potential restoration or other conservation actions are sensitive for cultural resources, including prehistoric and historic archaeological sites as well as human remains, architectural resources, and rural historic landscapes. Specific conservation actions that would result in foreseeable ground-disturbing work that could alter or impair the significance of NRHP-, CRHR-, or local registry-eligible cultural resources are listed below.

- *CM2: Yolo Bypass Fisheries Enhancement*
- *CM3: Natural Communities Protection and Restoration*
- *CM4: Tidal Natural Communities Restoration*
- *CM5: Seasonally Inundated Floodplain Restoration*
- *CM6: Channel Margin Enhancement*
- *CM7: Riparian Natural Community Restoration*
- *CM8: Grassland Natural Community Restoration*
- *CM9: Vernal Pool Complex Restoration*
- *CM10: Nontidal Marsh Restoration*
- *CM18: Conservation Hatcheries*

These measures would result in effects on cultural resources when ground-disturbing work is performed to construct improvements and enhance or restore natural communities. Direct effects would occur through demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic archaeological sites, unique archaeological sites, TCPs, human remains, and built environment resources. Indirect effects may occur where changes to the setting alter the existing setting in a manner that is inconsistent with the feeling and association of the resource. For example, reclaimed agricultural landscapes that are converted to habitat may no longer convey the themes of agriculture and settlement, and thus would be inconsistent with remaining features associated with rural historic landscapes created by reclamation, cultivation, and ranching. These effects would be material alterations and adverse effects because they would diminish or destroy the ability of these resources to convey their significance.

Because of the large acreages of land included in all conservation measures that would be implemented under this alternative, it is unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique archaeological sites could be avoided. Therefore, this impact would be adverse. Mitigation Measure CUL-7 below addresses this effect.

**CEQA Conclusion:** Construction and implementation of conservation measures would result in ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and built environment resources such as historic architectural structures and rural historic landscapes. The same construction may damage unique archaeological sites. This construction would likely result in materially adverse changes for the following reasons:

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- ground disturbing construction in archaeological sites disrupts the spatial associations that contain data useful in research, thus diminishing or destroying the basis for the significance of the resource, and;
- ground disturbing construction may either directly demolish or indirectly affect the setting of built environment resources, resulting in an inability of the resource to convey its significance, and;
- ground disturbing construction may either directly demolish or change the setting of traditional cultural properties resulting in an inability of the resource to convey its significance.
- ground disturbing construction may inadvertently disturb human remains.

The alteration of a resource that changes the characteristics that convey its significance is a material alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under CEQA under the Appendix G checklist. Because this construction would materially alter these categories of resources and disturb human remains it would result in a significant impact. Mitigation is available to reduce these impacts by identifying and evaluating resources, avoiding resources where possible, and developing treatment where avoidance is not possible. In addition construction would be monitored. However, because of the acreage associated with the proposed restoration under conservation measures, as well as the multiple constraints associated with other environmental resources that require mitigation or avoidance, it is unlikely that all cultural resources could be avoided. Therefore, this impact remains significant and unavoidable.

#### **Mitigation Measure CUL-7: Conduct cultural resource studies and adopt cultural resource mitigation measures for cultural resource impacts associated with conservation component implementation**

Please refer to Mitigation Measure CUL-7 above, for Alternative 1A.

#### **Impact CUL-8: Compatibility of the proposed water conveyance facilities and other conservation measures with plans and policies**

Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could result in the potential for incompatibilities with plans and policies adopted to protect the cultural resources of the Delta. A number of plans and policies that coincide with the study area provide guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether Alternative 9 is compatible or incompatible with these policies, rather than whether impacts are adverse or not adverse or significant or less than significant. Because Alternative 9 would result in the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the BDCP will be compatible with these policies because significant cultural resources will be avoided where feasible, and mitigation will be implemented to reduce effects where avoidance and preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

**CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by the various counties with jurisdiction in this region. For policies that emphasize preservation or mitigation the BDCP will be compatible with these policies because DWR and Reclamation will implement cultural resource management practices that will identify significant resources, preserve such resources where feasible, and complete mitigation to reduce significant effects where preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible because multiple constraints governing the location of proposed facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

### 18.3.5.17 Cumulative Analysis

#### Assessment Methodology

This cumulative impact analysis considers projects that could affect cultural resources within the same timeframe as the BDCP alternatives, which could result in cumulative effects on cultural resources. Although cultural resources typically manifest as discrete archaeological sites, structures, or residences, the combination of projects in the region can result in a cumulative loss of these resources and associated data potential for archaeological research as well as examples of significant historical themes and instances of significant engineering or design. In addition, for rural historic landscapes, historic districts, and other cultural resources that cover large geographic areas, the combined effects of numerous projects at disparate locations can potentially result in a loss of integrity that diminishes the quality of the individual resources. This section first analyzes the cumulative setting, to determine where the range of reasonably foreseeable projects and programs in the Delta will result in a significant cumulative effect on cultural resources. This range includes the BDCP. This section then analyzes the contribution of the BDCP to determine if that contribution is cumulatively considerable.

#### Cumulative Setting

The set of programs and projects that would occur within the same timeframe as the BDCP will collectively result in the cumulative loss of cultural resources. The BDCP will contribute to this loss. While the various alternatives analyzed above would each affect a slightly different set of resources, each alternative would result in adverse effects on cultural resources. This setting describes the other projects that, in combination with the BDCP, will result in adverse effects on cultural resources.

Levee repair programs will result in repair and maintenance of existing project levees in the Delta. The construction of upgrades and repair of existing levees will result in ground-disturbing work that has the potential to result in adverse effects on archaeological resources, built-environment structures, and large landscape-level cultural resources such as historic districts, rural historic landscapes, and traditional cultural properties. These effects typically occur when construction of setback levees or widening of existing levee prisms disturbs landside archaeological resources, or where borrow activity necessary to provide fill material disturbs the same resources. In addition, maintenance and repair projects can result in the demolition of structures and residences that form

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portions of rural historic landscapes associated with themes of reclamation and agriculture. Where deep cutoff walls are constructed through existing levee prisms, buried archaeological resources may be damaged or destroyed.

Restoration projects may require inundation to enhance wetland and riparian vegetation, which in turn expedites the decay of archaeological resources, and may require demolition of structures and residences in the Delta.

Infrastructure projects such as the California High-Speed Rail System, Sacramento to Merced Section, will require ground-disturbing construction along linear corridors where new rail service is placed, resulting in disturbance of archaeological resources and demolition of built environment resources. Human remains may be encountered and disturbed where they occur as part of larger archaeological sites, or also as discrete burials.

Development and plan buildout under general plan blueprints results in the conversion of raw land and the associated disturbance of archaeological resources, buried human remains, and, in some cases, demolition of existing built environment structures and residences.

Although project proponents will implement typical mitigation and avoidance measures for most if not all projects occurring as part of the cumulative context, unavoidable effects on cultural resources will nonetheless occur because it is not always feasible to avoid resources. Treatment such as data recovery or documentation cannot replace the lost resource and therefore would not reduce impacts to less-than-significant levels. In addition, archaeological resources are often encountered and damaged inadvertently during construction because these resources cannot be identified before construction takes place.

A sample of the projects considered as part of the cumulative context is provided below in Table 18-4. The complete set of projects that form the cumulative context is provided in Appendix 3D [cumulative and no action project list].

**Table 18-4. Cumulative Context for Effects on Cultural Resources**

Agency	Program/Project	Status	Description of Program/Project
California Department of Water Resources and Solano County Water Agency	North Bay Aqueduct Alternative Intake Project	Planned action	This project will construct an alternative intake on the Sacramento River and a new segment of pipeline to connect it to the North Bay Aqueduct system, with the possibility of disturbing existing cultural resources.
Reclamation District 2093	Liberty Island Conservation Bank	Planned action	This project includes the restoration of inaccessible, flood prone land zoned as agriculture but not actively farmed, to area enhancement of wildlife resource. Changes in land cover may expedite the decay of existing cultural resources.

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California High Speed Rail Authority and Federal Railroad Administration	California High-Speed Rail System, Sacramento to Merced Section	Briefing on Initial Alternatives completed. Sacramento to Merced section is part of Phase 2.	Development of new high-speed rail service will disturb and demolish existing cultural resources.
Bureau of Reclamation	Delta-Mendota Canal/California Aqueduct Intertie	Anticipated completion by 2012.	New project facilities include a pipeline and pumping plant that could disturb cultural resources occurring in the path of these features.
SWP/CVP operations	Throughout Plan Area	Continuing actions	Repair and maintenance activities may disturb or demolish cultural resources.
CALFED Levee Stability Program	Existing project levees in the Delta	Continuing actions	Protection of resources in the Delta through maintenance and improvement of existing levees may disturb or demolish cultural resources.
Delta Wetlands Project	Semitropic Water Storage District	Planned action	Wildlife enhancement on Delta islands may demolish cultural resources or expedite decay of cultural resources.

### **Impact CUL-8: Potential for the action alternatives to contribute to the cumulative loss of cultural resources in the Plan Area**

#### **Alternatives 1A through 9**

The action alternatives vary in terms of location and scale of construction. Tunnel alternatives would avoid some surface resources where tunnels would replace canals, but would require construction of large intakes, tunnel muck disposal areas, and associated features. Alternatives that would result in construction of an eastern or western canal would also require construction of large intake features along the northern end of proposed alignments and would require excavation and borrow activities along the entire right-of-way. Alternative 9 would have a smaller footprint, but also has the potential to result in significant and unavoidable effects on cultural resources.

Collectively, all action alternatives have the potential to result in the following categories of impacts.

- Demolition or destruction of identified and identifiable archaeological and built environment resources that qualify as historical resources, unique archaeological sites, or historic properties.
- Demolition or destruction of archeological sites that qualify as historical resources, unique archaeological resources, and historic properties that cannot feasibly be identified in advance of construction.
- Demolition or destruction of buried human remains that occur cannot be feasibly be identified in advance of construction.

Because the action alternatives would generate these effects they would make a cumulatively considerable contribution to a cumulatively significant loss of cultural resources in the Plan Area. Mitigation Measures CUL-1 through CUL-7 are available to reduce this effect, however, because all

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effects cannot be reduced to less than significant, the BDCP would still result in a cumulatively considerable contribution.

**CEQA Conclusion:** The set of projects that would be implemented in the Plan Area during the same timeframe as the BDCP, including the BDCP, will result in a cumulatively significant loss of cultural resources. Each of the action alternatives has significant and unavoidable effects on identified and identifiable archaeological resources and built environment resources. In addition each action alternative has the potential to result in significant and unavoidable effects on buried human remains and buried archaeological sites that cannot feasibly be identified in advance of construction. Therefore, the action alternatives would each make a cumulatively significant contribution to a cumulatively significant loss of cultural resources.

**Mitigation Measure CUL-1: Prepare a data recovery plan and perform data recovery excavations on the affected portion of the deposits of identified and significant archaeological sites**

Please see Mitigation Measure CUL-1 under Impact CUL-1 in the discussion of Alternative 1A.

**Mitigation Measure CUL-2: Conduct inventory, evaluation, and treatment of archaeological resources**

Please see Mitigation Measure CUL-2 under Impact CUL-2 in the discussion of Alternative 1A.

**Mitigation Measure CUL-3: Implement a cultural resources discovery plan, perform training of construction workers, and conduct construction monitoring**

Please see Mitigation Measure CUL-3 under Impact CUL-3 in the discussion of Alternative 1A.

**Mitigation Measure CUL-4: Follow state and federal law governing human remains if such resources are discovered during construction**

Please see Mitigation Measure CUL-4 under Impact CUL-4 in the discussion of Alternative 1A.

**Mitigation Measure CUL-5: Consult with relevant parties, prepare and implement a built environment treatment plan**

Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

**Mitigation Measure CUL-6: Conduct inventory, a survey of inaccessible properties to assess eligibility, determine if these properties will be adversely effected by the project, and develop treatment to resolve or mitigate adverse impacts**

Please see Mitigation Measure CUL-6 under Impact CUL-6 in the discussion of Alternative 1A.

**Mitigation Measure CUL-7: Conduct cultural resource studies and adopt cultural resource mitigation measures for cultural resource impacts associated with conservation component implementation**

Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A.

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